GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

CAN YOUR RANGE SALESMEN ANSWER THESE QUESTIONS?

HOW TO CONVINCE HOMEMAKERS THAT A NEW RANGE SHOULD HEAD THEIR SHOPPING LISTS.

This handbook gives convincing, logical reasons why it's more practical for a homemaker to invest first in a new range before buying other needed items.

HOW TO SHOW HOMEMAKERS THEY CAN SAVE A MINIMUM OF $88 A YEAR WITH MODERN RANGE COOKERY.

This handbook shows how homemakers can save money as well as improve the quality and appearance of food.

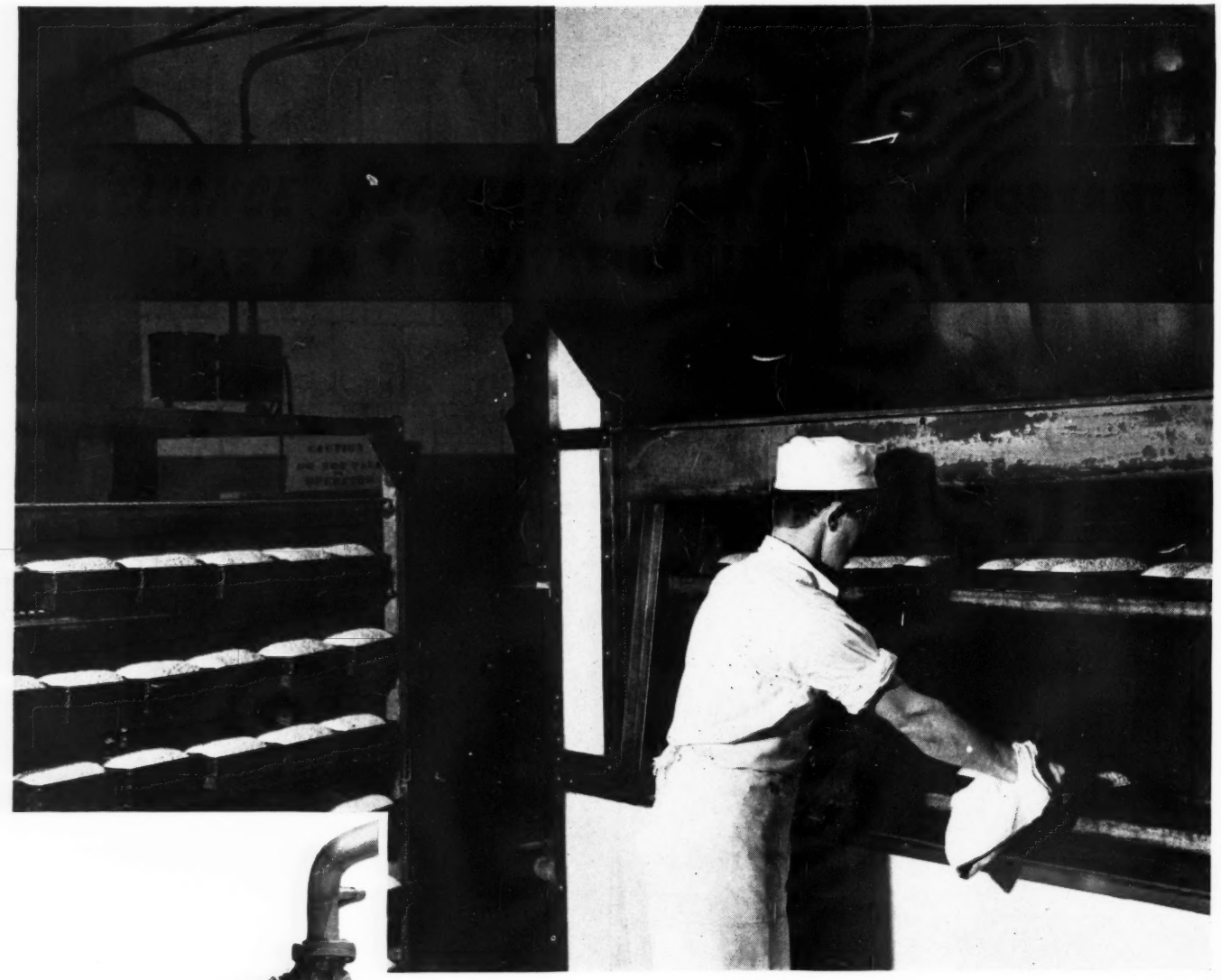
HOW TO TALK TO HOMEMAKERS IN COOKERY TERMS

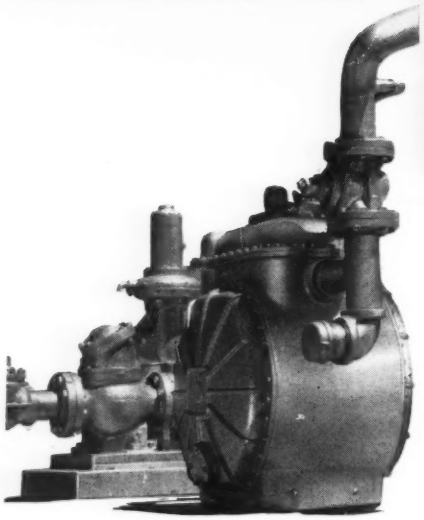
This hand book explains and illustrates basic principles of baking, roasting and whole-meal oven cookery. Common cooking failures are analyzed. Will give your salesmen an intensive course in modern cooking methods.

SEND FOR THIS FREE HANDBOOK

—38 pages of facts, pictures and ideas on modern range selling.
You can use this valuable book as a basic sales training piece for new salesmen—as a refresher course for old hands.
Write for as many as you need.

Robertshaw
THERMOSTAT COMPANY
YOUNGWOOD, PENNSYLVANIA





American Metric Ironcase Meters and Reliance Combination Balanced Valve Regulators efficiently control gas pressure to maintain even temperature in many of our modern baking plants.

Providing an essential part of every meal for all of us, the baking industry is indeed "big business" today. In large, spotlessly clean plants, with modern methods and mass production efficiency, and through up-to-the-minute distribution, these necessities and "goodies" are brought to you . . . fresh, flavorful and taken for granted . . . for just a few pennies a day.

In the preparation of fine quality bakery goods, a positive control of temperature in gas fired ovens is an absolute necessity. And it is in the positive control of these temperatures that Reliance Regulators play their important part.

For over thirty-four years Reliance Engineers have worked with industry to perfect the flawless, trouble-free performance built into every Reliance Regulator —performance you can depend on regardless of requirements.

Reliance Regulators are made in types and sizes most needed by the gas industry —distribution, industrial, domestic—for natural, manufactured and liquid petroleum gas.

Reliance bulletins give complete information. Write TODAY for your copy.

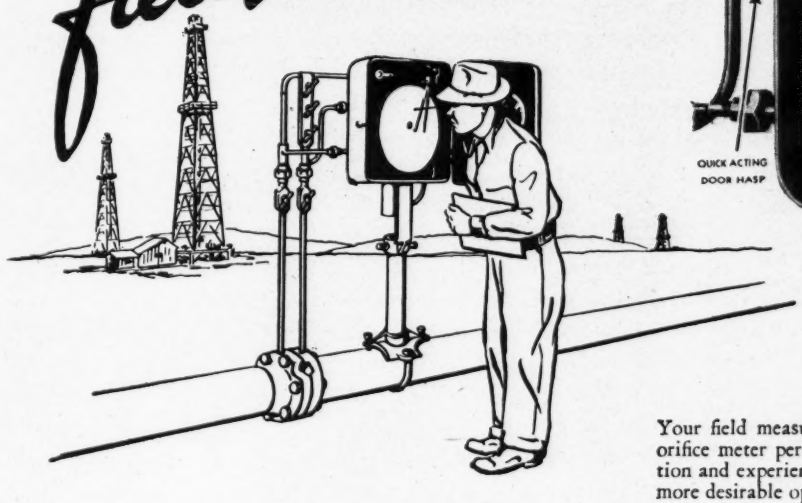
AMERICAN METERS

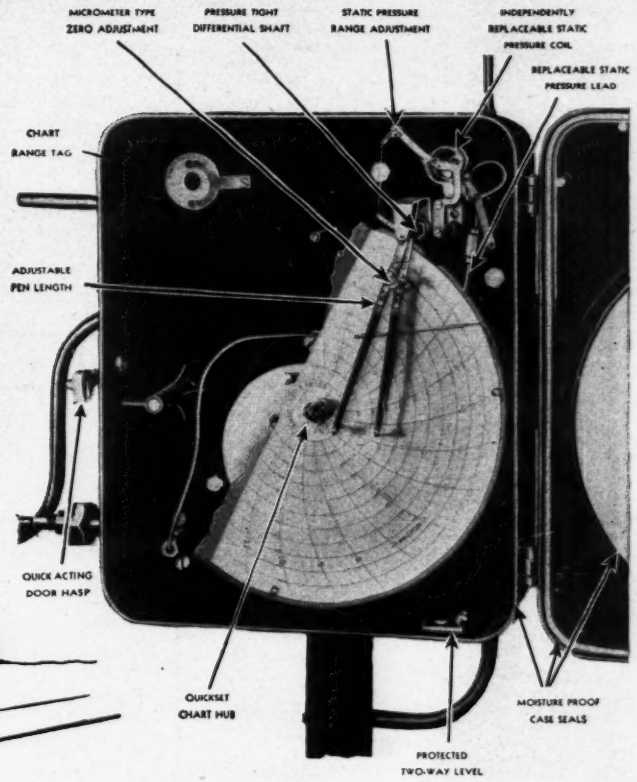
RELIANCE

AMERICAN METER CO. EST 1836

RELIANCE REGULATORS

ASK YOUR OWN *field men*





Your field measurement men are in the best position to judge orifice meter performance and value. From front line observation and experience they will tell you that the Emco Gauge has more desirable operating features than any other design.

About THESE FEATURES

SIMPLIFIED ARRANGEMENT OF PARTS—Permit on-the-job operations to be accomplished with ease.

"QUICK-SET" CHART HUB—No loose parts. No threads. Cannot become lost or misplaced.

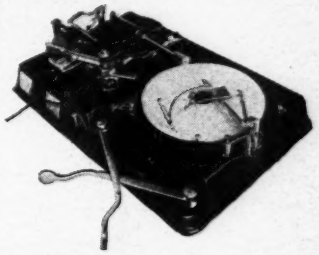
CHART RANGE TAG—Tells at a glance the static and differential range of the meter and the chart to be used for it.

POSITIVE INKING—Chart moves from under side of pen to top side. Eliminates blurred or missing records.

STURDY, OVERSIZE WORKING PARTS—Hold field service to a minimum.

SERVICE CONVENIENCE—The entire meter can be quickly disassembled or built up using common, every day tools.

IMPROVE ACCURACY, SAVE ON CHART COMPUTATION COSTS WITH THE EMCO-McGAUGHY INTEGRATOR



Mechanically and exactly calculates the extension of orifice meter charts. Assures that the accurate record made by the orifice gauge will be converted into accurate totals. Provides verified records of results.

One machine will calculate up to 300 average charts per day.

PITTSBURGH EQUITABLE METER DIVISION

Rockwell Manufacturing Co.

PITTSBURGH 8, PA.

instrument accurate

EMCO ORIFICE METERS

Advertisers

American Meter Co.	62-63
American Radiator & Standard Sanitary Corp.	—
American Recording Chart Co.	95
American Stove Co.	—
Barrett Division	15
Blaw-Knox Co.	10
Carbide & Carbon Chemical Corp.	93
Cast Iron Pipe Research Assoc.	7
Chaplin Fulton Mfg. Co.	—
Clark Bros. Co., Inc.	—
The Cleveland Heater Co.	92
The Cleveland Trencher Co.	—
Columbia Gas & Electric Corp.	—
Connelly Iron Sponge & Governor Co.	94
The Cooper-Bessemer Corp.	—
Crane Co.	11
Cribben & Sexton Co.	3
Day & Night Mfg. Co.	—
Dearborn Chemical Co.	—
Detroit Brass & Malleable Works	13
Detroit Lubricator Co.	8
Domestic Thermostat Co.	81
Dresser Industries, Inc.	9-79
Dresser Manufacturing Division	9
El Van Ayre Corp.	Fourth Cover
Empire Stove Co.	—
Fisher Governor Co.	—
Fisher Research Laboratory	93
Florence Stove Co.	65
The Flour Corp., Ltd.	16
General Controls	Third Cover
General Gas Light Co.	89
James Graham Manufacturing Co.	24
Grayson Heat Control, Ltd.	4
Hammel Radiator Engineering Co.	—
Handley Brown Heater Co.	—
Hardwick Stove Co.	77
Harper-Wyman Co.	66
Hydrauger Corp., Ltd.	—
Inland Manufacturing Co.	94
Johns-Manville	26
Kitson Co.	—
Lake Chemical Co.	—
Lee B. Mettler Co.	—
Milwaukee Gas Specialty Co.	—
Minneapolis-Honeywell Regulator Co.	83
Mueller Co.	94
National Tube Co.	19
Natural Gas Odorizing Co.	—
Nordstrom Valve Co.	17, 18
Norton-McMurray Mfg. Co.	98
Oronite Chemical Co.	69
Pacific Gas & Electric Co.	6
Payne Furnace Co.	—
Phillips Petroleum Co.	—
Pittsburgh Equitable Meter Div. Rockwell Mfg. Co.	1
E. Holley Poe & Assoc.	91
Reliance Regulator Corp.	Second Cover
Reynolds Gas Regulator Co.	97
Rheem Manufacturing Co.	—
Roberts-Gordon Appliance Corp.	73
Roberts & Mander Corp.	20
Robertshaw Thermostat Co.	Front Cover
Roots-Connersville Blower Corp.	—
Geo. D. Roper Corp.	—
Security Manufacturing Co.	—
Semet-Solvay Engineering Corp.	95
Servel, Inc.	58, 59
Sharples Chemical, Inc.	5
M. B. Skinner Co.	75
A. O. Smith Corp.	—
Sprague Meter Co.	14
Stacy Bros. Gas Construction Co.	79
Standard Remote Control Valve Co.	98
Thermac Co.	96
Titan Valve & Mfg. Co.	87
Union Carbide & Carbon Corp.	93
U. S. Pipe & Foundry Co.	—
United Petroleum Gas Co.	—
United States Steel	19
Vulcan Proofing Co.	—
Wailes Dove-Hermiston Corp.	—
Walworth Co.	12
Ward Heater Co.	61
Warren Petroleum Corp.	91
Webster Engineering Co.	23
Welsbach Engineering & Management Corp.	—
Williams Radiator Co.	92
Gar Wood Industries, Inc.	—

GAS

REG. U. S. PATENT OFFICE

Twenty-Second Year of Publication

ECA

Contents for November, 1946

EDITORIAL COMMENT

Thermally Thinking, *by Elliott Taylor* 21
Highlights 25
Technical Trends, *by Guy Corfield* 72
Promotional Notes and Notions, *by Stanley Jenks* 74

FEATURE ARTICLES

Report on Atlantic City Convention, *by Elliott Taylor* 27
A.G.A. Committee Reports on Reserves, *by N. C. McGowen* 33
Why Louisiana Wants to Keep Its Natural Gas, *by P. A. Frye* 35
The Gas Company's Equity in Industry, *by E. M. Tharp* 39
Atomic Power—Its Future as Industrial Fuel, *by E. R. Gilliland* 42
Utilities That Help Dealers Help Themselves, *by H. C. Gurney* 45
Using Nordstrom Valves as Pressure Regulators, *by W. A. LaViolette* 46
Tennessee Gas Builds $30 Million Additions to 1265-Mile Pipe Line 49
Gas Companies Should Promote All-Year Air Conditioning, *by Louis Wollenberger* 52
The Blue Flame Shines at the State Fair in Texas 55
Company Publications Can Pay Dividends, *by K. C. Pratt* 60
A Wisp of Smoke Led to a Sale, *by William Helme* 67
Low Temperature Heating With Radiant Tubes, *by M. R. Duchene* 68
Sales Pointers on New Appliances 76
Laclede Trains Gas Appliance Dealers, *by Bert R. Merrill* 82

DEPARTMENTS

Associations 56
Operating Ideas 78
New Products 80
Catalogs 96
Current Reading 86
People 88
Pipe Line News 92

ELLIOTT TAYLOR, Editorial Director
52 Vanderbilt Ave., New York 17, N. Y. MUrray Hill 2-4504.

Publication Office

LOS ANGELES 14, California, 1709 West Eighth Street, DRexel 4337.

Branch Offices

DAVID CARMEN, Manager, **CHICAGO 3,** 1064 Peoples Gas Building, WABash 2589

L. V. HOHL, Manager, **NEW YORK 17,** 50 E. 42nd Street, MUrray Hill 2-4504

ROBERT B. FARSON, Manager, **DALLAS 1,** 301 Southland Life Building, CEntral 4585

Executive

JAY JENKINS .....President and Publisher
JAMES E. JENKINS.....Secretary-Treasurer

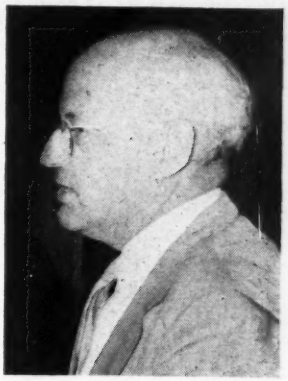
Editorial

BILL CLARK ..... Managing Editor
GUY CORFIELD .....Technical Editor
PAUL LADY .....Assistant Editor
O. D. HALL .....Mid-Continent Editor

November 1946. Volume XXII. Number 11. GAS is published monthly by Jenkins Publications, Inc., 1709 West Eighth Street, Suite 320, Los Angeles 14, California. Subscription price: United States, Canada, Mexico, Cuba, South and Central American countries (in advance), 25 cents the copy; $2.00 per year. All other countries, $3.00 per year. Acceptance under the Act of June 5, 1934 was authorized February 26, 1946. Member: The Controlled Circulation Audit, Inc. Publishers: BUTANE-PROPANE NEWS; Handbook BUTANE-PROPANE GASES; BOTTLED GAS MANUAL, WESTERN METALS.

THERMALLY THINKING

By ELLIOTT TAYLOR, Editorial Director



Big Inch Bluster

IT is so easy to pick up inside tips on what the War Assets Administration is planning to do about the Big and Little Inch pipe line bids that we are almost crowded off into the lonely position of being the only interested commentator without a private keyhole to peer through.

Since all we know is what we write in the papers, it might be a good point for us to go back over the various rumors, predictions, and promises that we have helped to peddle and see how much of it adds up to anything like an impending award of the lines to anyone at the present time. In case you don't want to read clear to the end of this piéce, we can say here at the outset that our answer is going to be that nobody will get the lines until the new Congress meets; and by that time it is likely that the simple economics of the whole problem will dictate that they be sold or leased to one of the natural gas transmission bidders, the Symington report and its recommendations notwithstanding.

There is no reason why the WAA can't award the lines right now to any one of the 16 bidders who are asking for them, and by so doing get rid of the whole problem in one manly gulp. But the WAA probably won't do that because it is afraid of everything, including its own shadow, the shadow in this instance being the three men on its own utilities branch, an extra-legal agency within an agency, set up within WAA framework to "negotiate" on disposals of a utility nature—principally the war emergency pipe lines.

Oil On Inside Track

It is common gossip that the utilities branch has already recommended or will recommend to the WAA that the lines be sold to one of the oil transmission bidders, probably the Big Inch Oil, Inc., which has offered a complicated proposition adding up to $110 million of which the government would have to take $44 million back in income debenture bonds of the corporation.

Setting the stage for a shift of responsibility to other agencies, in the event that it should decide to go along with its utilities branch recommendation, the WAA a few weeks ago created a special advisory council, including representatives of the Army, Navy, and Interior departments, the Federal Power Commission, and the Interstate Commerce Commission. When this so-called council of advisers found out that they had been assembled merely to endorse a fait accompli—the disposal of the lines to an oil bidder—the impotent organization folded up fast. The truth of the matter is that with the exception of the army and navy, which are now believed to be completely neutral in the matter, the rest of official Washington would rather see the lines go to gas than to oil. Thus when the advisory council was advised that it was expected to limit its considerations to those proposals in compliance with the Symington report of January last (recommending the continuation of the lines in petroleum service) the other agencies understandably enough wanted no part of it.

WAA On The Spot

Now the WAA is in a tough spot. But it is only because of its own bull-necked determination to dispose of the lines in a manner that runs counter to the transportation economics of the oil industry, the desperate needs of the natural gas industry, and the convenience and necessity of the gas-consuming public. If WAA goes ahead now and tries to slip through a deal with any of the oil bidders, its paradoxical position will be so conspicuous that Congress cannot conceivably ignore the implication of motivated dealing; the gas and oil producers of the southwest will be up in arms and the fuel-hungry millions on the Atlantic seaboard can and should be aroused to militant resentment.

The simple facts of the case are: (1) The petroleum industry does not want the lines retained in oil service, and has indicated through statements and opinions of qualified experts that they cannot be economically operated in competition with tankers; (2) The gas utilities at the delivery ends of the lines want and need all the natural gas that can be put through them; and (3) In the state of Texas and at points within economic piping distance of the receiving ends of the lines, 350 MMcf of gas is being wasted daily, with another 100 million to be picked up out of what is now being flared in Louisiana. (Provided always that the political powers of that proud commonwealth are willing to let their natural resources bring in some cash returns to the citizens of the state.)

Oilmen Disinterested

In understandable dollars and cents terms, the oil industry doesn't want the lines because it can't afford to pump oil through them in competition with tankers. According to testimony delivered before a government committee in 1937 by Howard Pew, president of the Sun

Oil Co., the cost of transporting oil by tankers and barges was .063 cents per ton mile as compared to .447 cents by pipe line. With this disparity of over 7 to 1 in favor of tankers, it is doubtful whether the petroleum industry could afford to use the oil lines if they were turned over to them by the government free of charge.

And, incidentally, in this day when the wishes and demands of organized labor have to be considered with greatest solicitude, how about the crews of the tanker fleet that would be displaced if the lines were placed in peacetime petroleum service? Competent engineers have estimated that the two lines would be obliged to carry 500,000 bbls. of oil per day, or ever 182 million per year, to achieve an economical operating load factor. This amount of transportation would be the equivalent of more than 2000 tanker trips of vessels averaging 90,000 bbls. capacity. With an average crew of 51 men per tanker, on a turnaround of two weeks between Gulf Coast ports and New York, the total number of man-days lost by these crews would be something in excess of 1.4 million in the course of 12 months. Certainly these workers have no less claim to consideration of their economic interests than have the coal miners whose representatives have so noisily intervened as obstructionists to every proposal for natural gas expansion.

East Needs Gas Now

That the gas is needed at the delivery end of the lines requires no supporting data as far as the operating utilities are concerned. Gas companies along the Atlantic coast are right now gravely apprehensive of their ability to handle this winter's peak loads; and all are working feverishly on plans to increase plant capacity or to find new sources or methods that will enable them to meet the demands anticipated in the winters that lie ahead. Only the lack of available new heating equipment and the failure of the housing program to materialize as rapidly as expected have partially postponed the gas fuel crisis that confronts the East. Independent surveys have already established beyond question that the lines' practical capacity of between 450 and 500 MMcf of natural gas per day can be utilized in the already existing market, for enriching and reforming the low Btu manufactured gas now being sold. To serve straight natural gas to the Eastern market would require additional new facilities far in excess of Big Inch capacities.

Importance of Higher Prices

The benefits that would accrue to the gas producing areas are almost incalculable. In the first place, the sale and use of gas now being flared would in itself be a conservation measure of first magnitude. Authorities of the gas and oil producing states who have striven manfully to prevent waste all agree that the only thing that can make natural gas conservation truly effective is higher field prices; and higher field prices are contingent on access and transportation to markets big enough to absorb the quantities of gas that must of necessity be produced in association with oil. Field prices for gas have been kept low because in the main oil well natural gas has been distress merchandise offered on what is strictly a buyer's market, if indeed any market at all could be found.

In an address before the American Gas Association in October, Gardiner Symonds, president of the Tennessee Gas and Transmission Co., quoted Dr. Gonzales of the Humble Oil and Refining Co. as saying that the average price of gas at the well in Texas today is two and one-half cents per Mcf, and the revenue obtainable from selling casinghead gas from the average oil well is only about 60 cents per day. This does not come near covering the expense of gathering, compressing and marketing this gas; as a result the oil operator, if he is to continue producing his oil well, has no recourse other than to flare the unwanted gas to prevent a hazard.

Conservation Will Benefit

Some of the natural gas bidders, seeking to acquire the right to operate the Big and Little Inch lines in gas service, have predicated their economic studies on prices as high as eight cents per thousand at the receiving termini of the lines. The establishing of any price even near eight cents, for gas taken in large quantities, would have the effect of raising the field price for all gas sold out of the producing areas. If the WAA has even a remote interest in adjusting its disposal policies to the economic improvement of the oil and gas producing states, the opportunity to perform this single service is as imminent as it is obvious.

But there are no indications at the present time that would strengthen our devout wish that the WAA might disregard the untenable position of its utilities branch and be one of the first, instead of the squalling and protesting last, of the government authorities to accede to the demands of sound economics, effective conservation, and the public convenience and necessity.

Apparently it is going to take more than common sense and logic to stir the WAA into intelligent action. It is going to take the application of a large political foot applied to the WAA anatomy at a point so traditionally encircled by armchair leather as to hake it invulnerable to anything less than a Congressional boot.

Which gets back to what we have already predicted, that the Big Inch issue deal is dead as far as any practical influence of WAA is concerned, and the final disposition will have to be made as the result of a direct legislative mandate.

FPC Declines Invitation

IN reply to an invitation from Administrator Robert M. Littlejohn of War Assets Administration, the Federal Power Commission has declined to participate in formulation of recommendations regarding disposition of the Big and Little Big Inch pipe lines. At the same time, however, the FPC offered to make available to WAA "such factual and technical information as we possess that may be of assistance to you."

The commission designated Commissioner Harrington Wimberly to represent it as an observer at the meeting of the WAA advisory board concerned with recommendations relative to the Big and Little Big Inch.

Substance of the FPC response to Mr. Littlejohn is contained in the following excerpts from its letter:

"The Federal Power Commission has, as you know, certain statutory responsibilities for the regulation of interstate natural gas pipe lines. Under the Natural Gas Act it will be necessary for anyone seeking to operate the Big or Little Big Inch pipe lines in the interstate transportation of natural gas or its sale for resale in interstate commerce to secure first a certificate of public convenience and necessity from this commission. Several applications for such authority are now pending. In these circumstances it is our opinion that it would be inappropriate for a representative of this commission to participate in the formulation by your board of recommendations concerning the various proposals which have been made regarding the disposition of the pipe lines in question."

Highlights

• A year ago when some 200 of us met in New York to transact in a limited way the annual business of the American Gas Association, a majority visualized, for October 1946, a totally different state of affairs in the world, in our nation, and in our industry from that which we now find.

• Instead of the unprecedented production that was visualized in our own country, we are beset on all sides with shortages, which bid fair to undermine our whole economy as the result of maladjusted states of mind of indivduals and the inflation which now is upon us. These shortages in most instances are caused by the continued existence of the very controls which have in theory been imposed and continued to prevent such shortages.

nature to endeavor to control our research expenditures, directing them along lines that seem likely to produce answers in the reasonably near future and into ideas and processes that we feel will be workable with a minimum of research expenditure. But by confining our efforts within these limits, we may be losing sight of the possibility of causing to become actualities some things that now seem only visionary to us.

• As a long-range project, it is recommended that the whole committee structure of the association be scrutinized carefully so that it may be determined whether consolidations, eliminations or a general streamlining may be in order—and above all to be sure we do not become over-committeeized.

Quotations reflecting the views of a competent observer and a sound, yet progressive executive of the gas utility industry, comprise this month's "Highlights." These quotations are excerpted from the address of Everett J. Boothby, retiring president of the American Gas Association, delivered at the 28th annual convention of the association at Atlantic City, Oct. 9.

• We have not been spared the effects of maladjusted states of mind in our labor relations. All materials which we purchase have gone up in price. Our costs of doing business have risen seriously and are likely to rise to even higher levels . . . The gas industry has been able generally to avoid asking for higher prices despite heavy increases in costs straight across the board. As costs still further increase, the time will come when some of our companies will no longer be able to continue this record.

• The Gas Industry's Research and Promotional Plan, now in its second fiscal year of three, has been well supported by all segments of our industry. That our companies so cohesively developed and so widely supported such a plan has . . . commanded the attention of the financial world and of our competitors, has improved the morale of the entire industry, has provided encouragement to our younger leaders and has given a program with which we can go forward on a united front.

• We should now launch a bolder attack on research —particularly utilization and production—pointing it in a direction that might be regarded by some as bordering on the visionary.

• In advocating a broader program of utilization research—one possibility entering into fields not heretofore considered—we must bear in mind the responsibility we have not to take over or undermine that which is rightfully the prerogative of the appliance manufacturer.

• On research, both utilization and production . . . to a certain extent we must gamble. It may be our

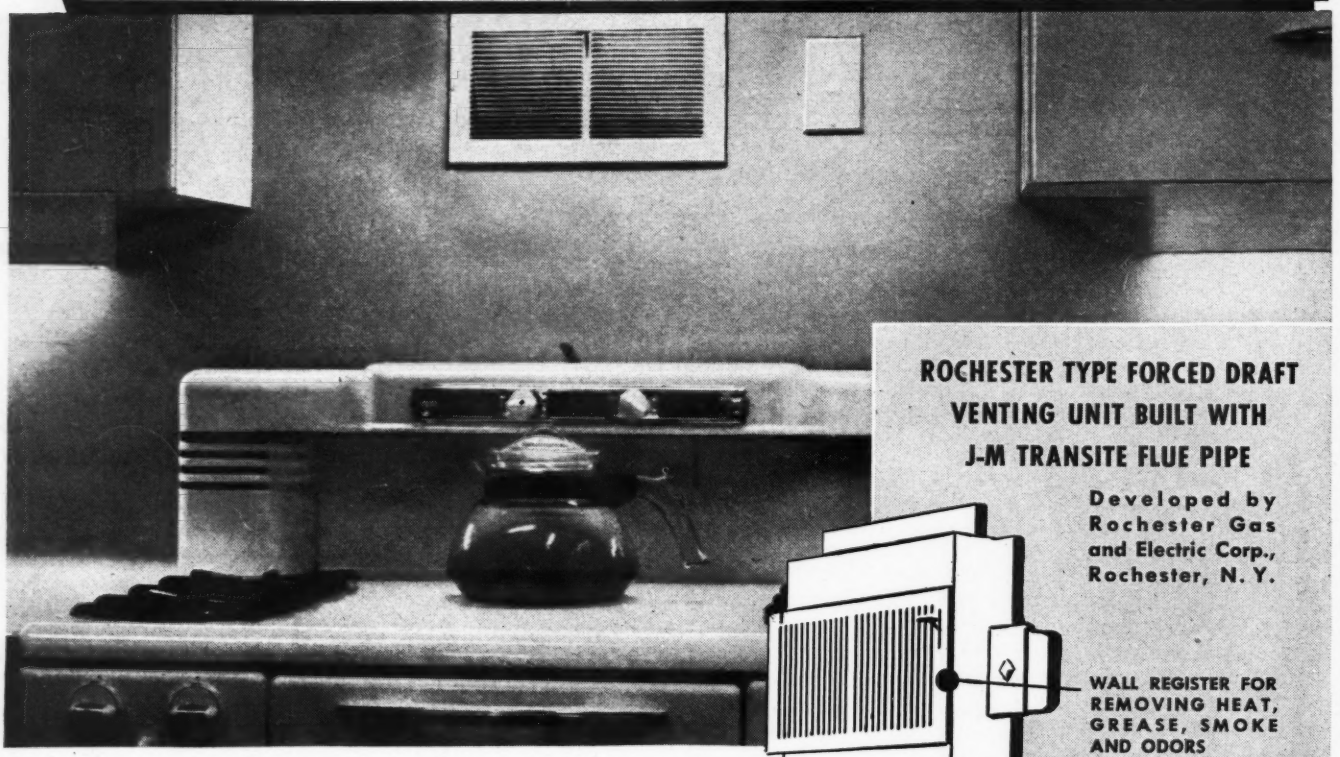
• With its remarkable singleness of purpose, with its wealth of experience . . . with its recognition of its obligation to serve, there is no question but that the gas industry is headed to immeasurable heights, that it will continue to deliver higher grade service, obtain the best prices for its securities and be a vital factor in the everyday lives of our people.

• It may well be that we of the gas utilities too frequently call for deviations from the manufacturers' standard design both for appliances and other devices such as meters, to such an extent that their production lines tend to become jobbing shops instead of something savoring of mass production. However . . . the manufacturers must not ignore the fact that after the appliance sale is concluded, relations between the customer and the utilities continue over a long period.

• There is no doubt that every change we call for, different from the manufacturers' standards, costs the manufacturers money, is bound to cost us and our customers money, and makes for confusion both to the manufacturers and ourselves . . . While admittedly there may be a limited number of companies whose manufactured gas is of a type to require special appliance treatment, it ought to be possible for us to get together for the purpose of diminishing the variance in what we require the manufacturers to furnish.

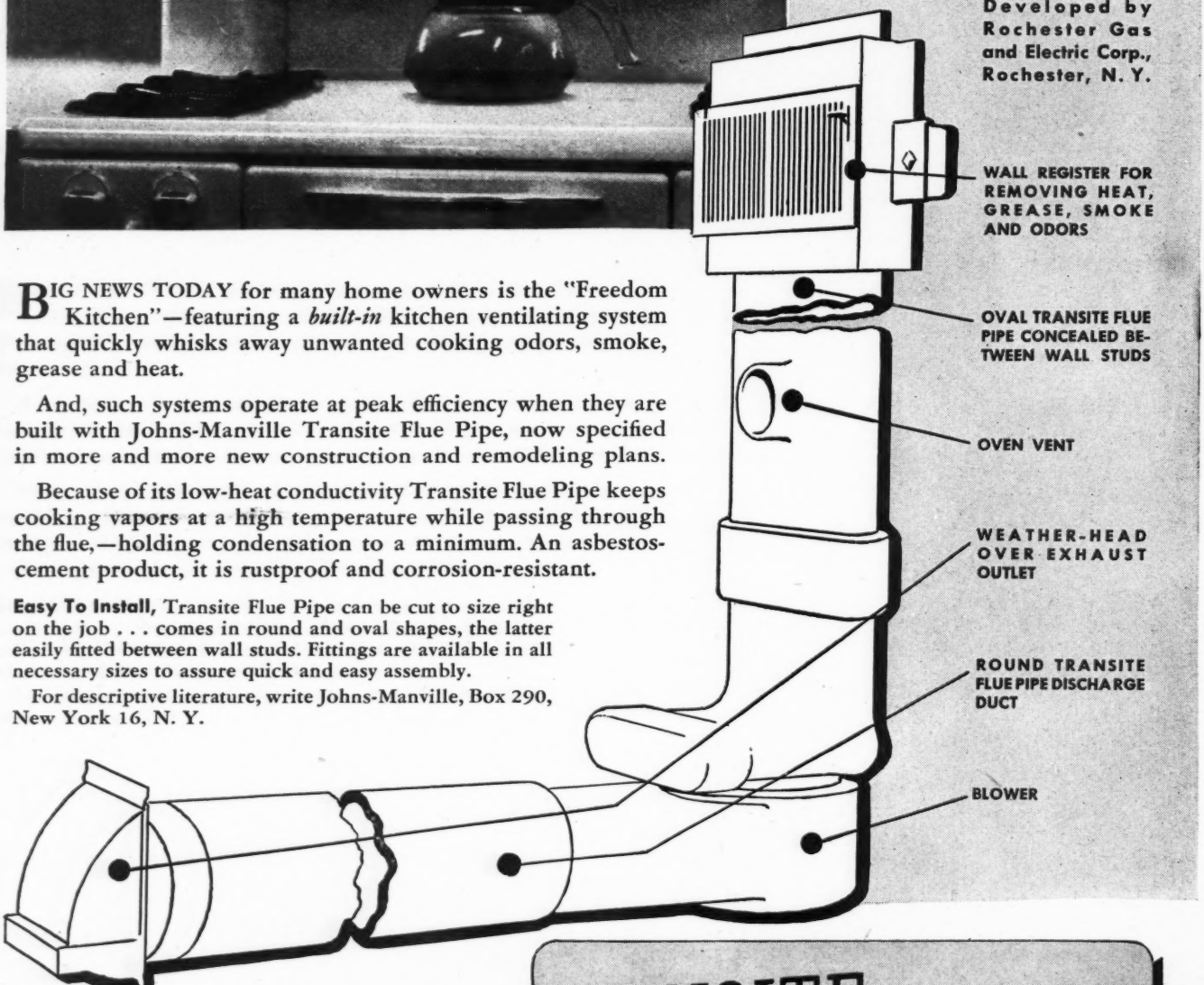
• The manufacturers are to be congratulated individually and as a group for the extent to which they have gone, against many difficulties, in providing their exhibits here at this convention, the first such magnificent exhibit in a full decade.

The "FREEDOM KITCHEN" IS CLEANER, COOLER vented with J-M TRANSITE FLUE PIPE



ROCHESTER TYPE FORCED DRAFT VENTING UNIT BUILT WITH J-M TRANSITE FLUE PIPE

Developed by Rochester Gas and Electric Corp., Rochester, N. Y.


WALL REGISTER FOR REMOVING HEAT, GREASE, SMOKE AND ODORS
OVAL TRANSITE FLUE PIPE CONCEALED BETWEEN WALL STUDS
OVEN VENT
WEATHER-HEAD OVER EXHAUST OUTLET
ROUND TRANSITE FLUE PIPE DISCHARGE DUCT
BLOWER

BIG NEWS TODAY for many home owners is the "Freedom Kitchen"—featuring a *built-in* kitchen ventilating system that quickly whisks away unwanted cooking odors, smoke, grease and heat.

And, such systems operate at peak efficiency when they are built with Johns-Manville Transite Flue Pipe, now specified in more and more new construction and remodeling plans.

Because of its low-heat conductivity Transite Flue Pipe keeps cooking vapors at a high temperature while passing through the flue,—holding condensation to a minimum. An asbestos-cement product, it is rustproof and corrosion-resistant.

Easy To Install, Transite Flue Pipe can be cut to size right on the job . . . comes in round and oval shapes, the latter easily fitted between wall studs. Fittings are available in all necessary sizes to assure quick and easy assembly.

For descriptive literature, write Johns-Manville, Box 290, New York 16, N. Y.

Johns-Manville TRANSITE **FLUE PIPE**

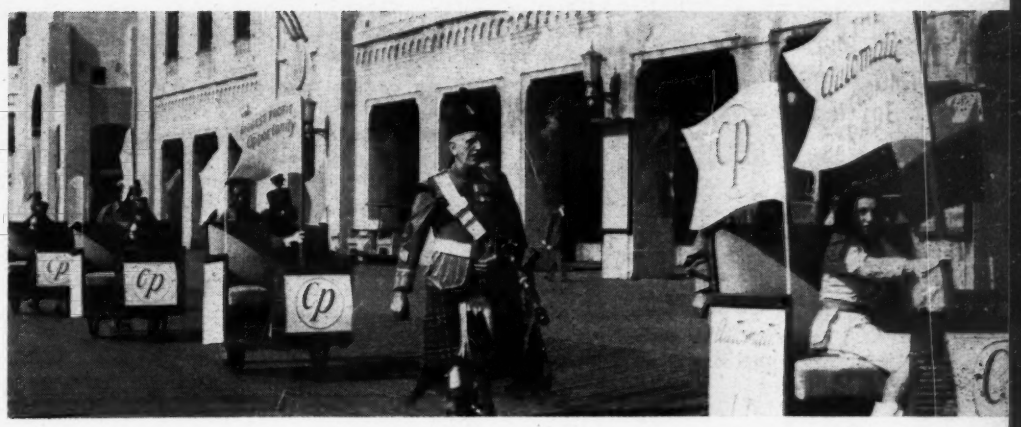
ATLANTIC CITY, N. J.

Oct. 7-11, 1946

Report on
the A.G.A.'s first large-scale
postwar convention

By ELLIOTT TAYLOR

Editorial Director



Girls parade along the famous boardwalks flashing banners boosting "CP" and "automatic."

THE problems posed by the gas utilities industry's position in a new, strange, and sometimes bewildering concept of the political, social, and economic direction of American business was the paramount concern of many of the 7000 members of the industry who registered during the week of the 28th annual American Gas Association Convention in Atlantic City last month. President Everett J. Boothby in his address to the delegates voiced the opinion that a state of affairs in the world and in the nation, totally different from that envisioned a year ago, is now to be coped with.

Looking back at the brave and promising postwar plans with which they had stimulated the hopes and imagination of gas consumers everywhere, utility men not only pondered the reasons for their inability to deliver the new and superior service and conveniences that had been dreamed of, but also regarded with no little concern the impact on public relations of their failure to deliver the wanted and anticipated improved standards in goods and services.

Industry Relations Uppermost

It was for this reason, no doubt, that discussion of every phase and aspect of industry relations appeared to take precedence over any technical, operational, or promotional considerations.

Industrial and labor relations bulked large as a subject of many papers and discussions in the general sessions, as well as in the numerous meetings of both the manufactured and natural gas departments and the various A.G.A. sections.

The harrassing and baffling problems incident to government regulation, perpetually in a state of flux by virtue of eternally new and unpredictable interpretations of existing law; attempts to pierce the veil of legislative intent in view of administrative inconsistencies and caprices, and the hint of possible new governmental demands and incursions in regulation were all considered.

Good Will Examined

Various aspects of utility customer relationship were also examined in an effort to chart a course for the future that would retain and enhance the confidence and good will that the gas industry has been able to build up over the many decades of its history.

Strictly inter-industry questions and considerations were by no means ignored, however, as the technical section discussed ways and means of best meeting the physical demands that an increasing and unsatisfied clamor for new and better gas service is developing.

Several meetings of the industrial and commercial gas sections concerned themselves with the many aspects of increasing the use of gas through fundamental and applied research in laboratories and in the field of industrial application.

Case for Home Service

Home service, once considered the gentle and minor preoccupation of a few earnest female employees, again reasserted its present position as an instrument of outstanding and indispensable application in the cultivation of the domestic cooking market and its housewife-practitioners.

Even the accounting section devoted most of its time to consideration of problems of customer and employee relationship, rather than to the techniques and practices of accounting methods.

All of the various promotional campaigns, including advertising, CP range promotion, the New Freedom Gas Kitchen, and numerous cooperative schemes undertaken jointly with allied

industries, were given exhaustive consideration and attention. Most outstanding promotional feature of all, and one of the greatest contributions of all time to industry enthusiasm, optimism, and morale, was the giant exhibit of gas appliances, appurtenances, and equipment staged by the Gas Appliance Manufacturers Association. While there was little that could be classed as revolutionary presented in all of the 60,000 sq. ft. of exhibits arranged by some 160 manufacturers of gas equipment, the very existence of the biggest display of its kind was in itself indicative of the manufacturers' progressive plans for the future.

Political Overtones

Falling as it did less than a month before national elections, it was inevitable that political considerations were subject of much unvoiced as well as outspoken concern; and into many addresses, subjectively far afield from politics, there was evidenced the note of warning that only a new administration devoted to the restoration of the principle of individual enterprise as a prime motivating factor in American industry would make available for general public enjoyment the many benefits and improvements that scientific and commercial planning have laid on the consumers' doorsteps.

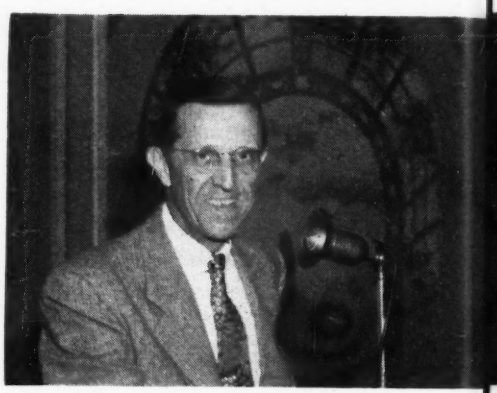
Employee relations was the subject of the first general session held on the afternoon of Monday, Oct. 7, and various aspects of this same theme were discussed in numerous section and departmental meetings on later days. Fred Rauch, chairman of the A.G.A. Personnel Committee and vice president of the Cincinnati Gas & Electric Co., presided at the opening forum in which the questions incidental to the maintenance of industrial peace were discussed.

Employee Relations

George W. Taylor, professor of industry at the University of Pennsylvania, was the lead-off speaker, discussing management's state in collective bargaining. Taylor, who is also chairman of the Advisory Board of the Office of War Mobilization and Reconversion and past chairman of the National War Labor Board, has acted as a neutral in many industrial arbitrations. He attributed the present industrial unrest to the failure of both management and industry to seize the opportunity of working together under the collective bargaining auspices of the Wagner act. He apprehended that failure to develop collective bargaining as a substitute for industrial warfare may threaten the very existence of both free enterprise and free organized labor. He stressed the double importance in the public utility field of a bargaining and arbitration procedure that would eliminate the danger of any

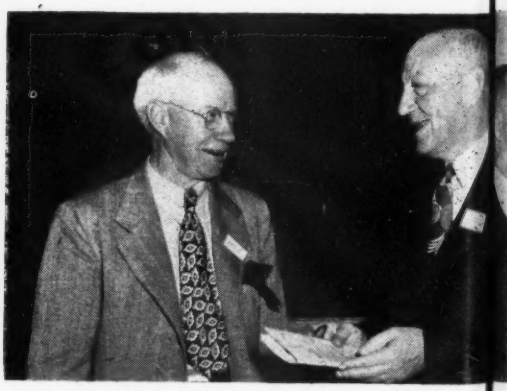
IN THE ATLANTY

C. I. Francis, atty., Houston. W. H. S



L. B. Moulton, Veterans Administration. C. Boule

Fred Rauch, Cincinnati Gas & Electric Co. Dr. G.



H. W. Reed, Philadelphia Gas Works Co. R. Hargr
and E. P. Noppel, Ebasco Services, Inc. A.G.A.

PLANNING DISPLAYS FOR GAMA

H. Leigh Whitelaw, GAMA managing director; John Robertshaw, first vice president; Lyle C. Harvey, former president; D. P. O'Keefe, president.

NY SPOTLIGHT

W. H. Senyard, United Gas Pipe Line Co.

C. Boulet, Wisconsin Public Service Corp.

Dr. G. W. Taylor, Univ. of Pennsylvania.

R. Hargrove, E. Boothby and R. Hendee, A.G.A. Pres.-elect, Pres. and 2nd VP-elect.

strikes or work stoppages which are so inimical to the interests of the entire consuming public.

Speaking from within the industry, C. B. Boulet, director of personnel, Wisconsin Public Service Corp., Milwaukee, described "A program for Labor Peace." This program was outlined by Boulet as containing the essentials necessary to the maintenance of satisfactory and amicable employee-management relations. Among these musts he included: intelligent supervision; adequate grievance procedure; cooperation in setting proper wages and proper wage scales; safe and healthful working conditions; standardization of policies respecting employee treatment; a reasonable guarantee of security and an adequate supply of information on company activities and policies available to employees. Boulet conceded that the building of an employee attitude sympathetic to the problems of management and confident of the latter's ability and willingness to look after the welfare of its personnel is not an overnight chore. "It must be developed," he said, "over the months and years, but when it is developed, it will remain a lasting monument to sound management."

Better Information Cited

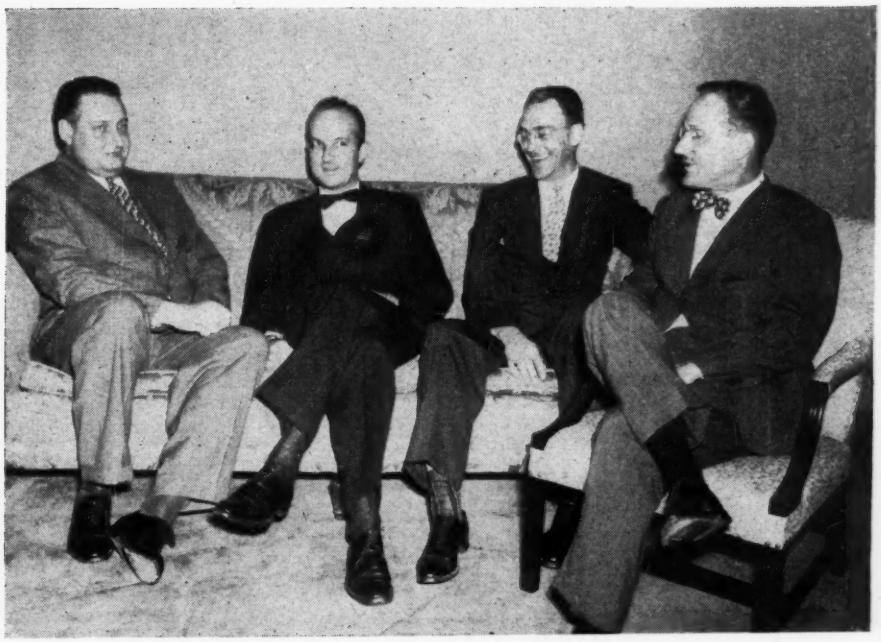
The matter of supplying adequate information to employees was taken up in more detail by W. H. Senyard, personnel director of the Louisiana Power and Light Co., New Orleans, who spoke on "Better Relations Through Better Information." He suggested a program of employee training that would involve monthly meetings of supervisors on a regular schedule with specific instructions from prepared texts on various aspects of advisory responsibility. Senyard concluded his remarks by saying: "The collective thinking in your company is that of your employees. The collective thinking in America is that of thousands of groups of employees just like yours . . . . to keep America sound, to keep American industry sound, the individual members of our business and industrial organizations must be fully acquainted with those problems and help in their soloution . . . . better relations will accrue from better information."

Moulton Speaks

In the meetings of the Accounting Section on both Tuesday and Wednesday further consideration was given employee problems when Lewis B. Moulton of the Veterans Administration spoke of "On the Job Training for White Collar Employees" and Kenneth A. McIntyre, consultant in industrial relations, discussed "Employee Relations in the White Collar Group."

At still another session—the Editor's Breakfast held on Tuesday morning—

GOVERNMENT AND GAS MEN CONFER



J. A. Krug, Secretary of Interior; Creekmore Fath, Krug's assistant; Walter E. Caine, A.G.A. Bureau of Statistics; Frank P. Hyer, General Public Utilities Corp.

K. C. Pratt, New York City authority on industrial publications, discussed the utility house organ as a medium for disseminating information to employees and for cementing satisfactory feelings of mutual accord between the utilities and their workers (See pp. 60, 64 of this issue.)

Government and Gas

All the various problems posed by government and state regulation of the natural gas industry and the gas distributing utilities found some place on the agenda of the convention. The outstanding feature of this phase of the 1946 deliberations was an address by Secretary of the Interior J. A. Krug, delivered on Tuesday, Oct. 8, before the largest single audience assembled during the week. The Secretary spoke warmly and with appreciation of the industry's position of "industrial leadership in America and the world."

Krug is favorably known to the gas utility industry as one of the most outstanding and sincere proponents in government of business and government cooperation. He lauded the gas industry for its record in fundamental research, many aspects of which have been undertaken and carried forward to the end that "more effective utilization of the natural gas supply might be achieved." He also urged re-doubling of interest in conservation activity, saying that no one could "justify the wastage of natural gas which is lost in connection with petroleum production. The loss of 680 billion cu. ft. of natural gas in 1943 is hard cash money out of your pocket and . . . . in the end out of mine and out of every citizen's."

No Hoarding Wanted

Outlining his concept of conservation, however, he made it clear that conservation means "not storage, nonuse and hoarding, but intelligent controlled consumption—consumption at rates and under conditions which maintain a stable industry and a continuous supply of the product to the consumer at a fair price." Speaking on general economic problems and voicing the view of the administration, Secretary Krug pointed out the grave danger in the trend of rising prices accompanied by a leveling off in the demand for non-durable goods.

"There is indication that the market cannot maintain its firmness with constantly rising prices . . . surveys show that the fat which industrial workers were *saving* to spend on gas refrigerators, gas stoves and durable goods, has been largely dissipated." He observed that the gas industry has traditionally been required to operate on a slender margin of profit, but has learned to do it with financial vigor.

Cost Rises Forecast

A considerably more realistic view of the situation in which regulated utilities find themselves—under present conditions of mounting costs to be recovered only under regulated rates—was expressed by A.G.A. President Everett J. Boothby, who warned that "our costs of doing business have risen seriously and are likely to rise to even higher levels. This trend makes the path no easier for regulated business. Generally, it has been only the utilities that have been able to go through the war, and thus far in the peace, without substantial increases in the prices charged the public for their products or services . . . As costs still further increase, the time will come when some of our companies will no longer be able to continue this record."

Boothby specifically urged that state regulatory bodies consider the inevitability of rate adjustments and be prepared to "act promptly in granting higher rates where they are necessary to permit the companies to continue their service on the same high plane as before."

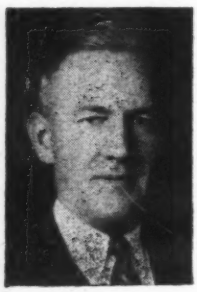
Ambiquities of Act Blamed

Another aspect of industry-government relations and one which has been the subject of much concern during the past year has been the extension of control over natural gas by the Federal Power Commission acting under the authority of the Natural Gas act. Charles I. Francis, an outstanding petroleum industry attorney from Houston, Texas, outlined in detail the various steps which the Federal Power Commission has taken in the direction of more stringent control over every phase of natural gas operation from production in the field to utilzation at the burner. Part of the responsibility and the blame for FPC incursions into the fields of regulation not envisioned by the Congress lies in the ambiguities in the wording of the Natural Gas act, according to the speaker.

To end administrative uncertainties

NEW SECTION AND COMMITTEE CHAIRMEN OF THE A.G.A.

Accounting



L. V. WATKINS
Panhandle Eastern Pipe Line Co.

Residential

W. CHAMBERLAIN
Michigan Consolidated Gas Co.

Publicity

E. M. THARP
Ohio Fuel Gas Co.

Industrial

KARL EMMERLING
East Ohio Gas Co.

Technical

C. S. GOLDSMITH
Brooklyn Union Gas Co.

Manufacturers

R. L. O'BRIEN
Detroit Brass & Malleable Works

and to bring FPC practice into line with the spirit and intent of Congress, Francis urged the gas industries to "present a united front in sponsoring legislation, and to restore the Natural Gas act to the original conception of its sponsors." The proposed amendments to the act would include specific prohibition of any federal restriction on the end-use of natural gas; exemption from federal regulation of those who produce and gather gas; and a policy whereby a natural gas company should be allowed the going field price at the well head for gas produced from its own properties in determining the rate base under the Natural Gas act.

Amendments Urged

"The oil and gas producers," said Francis, "as distinguished from interstate transporters, which are clearly natural gas companies under the provision of the Natural Gas act, have a particular and vital interest in seeing that this act is amended so as to insure that those who produce and gather gas and make a sale to inter-state transporters shall not be classified in this activity."

Calling for unity within the industry in resisting administrative encroachment on the legislative prerogatives of Congress, Francis concluded by saying: "Our railroad and coal antagonists have a united and clear cut program. We should be equally united, determined and forthright in presenting necessary classifying amendments to the next session of the Congress of the United States."

Gas Supply

Representatives of the two major departments of the gas industry, natural gas and manufactured gas distributors, gave consideration to the supply of their product and to the long-time availability of gas and the raw materials out of which it can be made.

Presented to the natural gas men in their department session was the first association-sponsored tabulation of the known natural gas reserves, undertaken under a committee headed by N. C. McGowen, president of the United Gas Pipe Line Co., Shreveport, La.. (See Page 33.)

Liquefied Petroleum Discussed

An authoritative discussion of the availability and probable costs of raw materials for manufactured and mixed gas utilities occupied one session of the manufactured gas department of the A.G.A. Here William R. Cameron, vice president of The General Coal Corp., A. J. McIntosh, chief economist of The Socony Vacuum Oil Co., Inc., and George R. Benz, manager, Chemical Products Department of Phillips Petroleum Co., discussed respectively coal, oil, and LP-Gas as raw materials for future gas supplies. In effect, all said that their products would be in ample supply and at competitive prices to justify their continued use by the manufactured gas industry.

Measures to Assure Supply

Gardiner Symonds, president of the Tennessee Gas and Transmission Co., developed the thought that there is plenty of natural gas available, and will be for many years to come, but that steps must be taken to insure a constant supply. Three of these propounded by Symonds included conservation, a higher field price for natural gas, and intelligent regulation.

Illustrating the need for higher prices to the producer, he quoted Dr. Gonzales of the Humble Oil and Refining Co., who says that the average price of gas at the well in Texas is two and one-half cents per Mcf; the revenue presently obtainable from selling the casinghead gas from the average oil well is only about 60 cents per day. This small potential revenue cannot cover the expense of gathering, compressing and marketing this gas from small fields and scattered wells, leaving the oil operator no other recourse than to flare the unwanted gas.

Extolling the advantages of natural gas, Symonds said: "You manufactured gas men know better than I do that competition is forcing you to enrich or convert completely, and this competition is growing more formidable every year . . . in my opinion butane gas is vastly superior as a fuel to manufactured gas. This is one type of competition that will force you to enrich . . . to a very high Btu value."

Production Techniques Studied

Improvements in the techniques of gas production, from a qualitative as well as a quantitative viewpoint, occupied a major share of the attention of the numerous meetings of the association's technical section, under the general chairmanship of L. J. Eck, vice president of the Minneapolis Gas Light Co. Manufactured gas technicians were particularly interested in the report of R. L. Bevan, chief engineer of the Union Gas Co. of Canada, Ltd., a company serving both manufactured and natural gas to numerous Canadian communities, where peak loads are being satisfied largely by the use of propane-air.

The experiences of The Peoples Gas Light & Coke Co., Chicago, in distributing mixed gas since 1931 were re-

WINNERS OF BEAL AND MUNROE AWARDS

H. M. HENRY

For his paper "Factors Relating to Economics of Gas House Heating," published by the A.G.A. in October, 1945, Hall M. Henry, director of gas operations, NEGEA Service Corp., Boston, was honored at the convention with selection as 1946 winner of the Beal Medal, highest technical award in the gas industry.

The paper presented an analysis of factors to be used in determining how to serve and utilize profitably the house heating load. A formula he developed enabled gas companies to ascertain overall costs under different load factor conditions, and provided best proportions for mixed gas utilization. Means of meeting peak load problems economically were also detailed by the author.

Winner of the Charles A. Munroe Award for 1946, for having made the most outstanding recent contribution toward the advancement of the gas industry, is Frederic O. Hess, president, Selas Corp. of America, Philadelphia. The honor, accorded Hess at the A.G.A. October convention, recognized his work in four fields: research, invention, development of new uses for gas, and increased sale of gas.

Hess' achievements stemmed from a personal study of gas combustion. He developed new devices which broadened the uses of gas, particularly for industrial heating processes. Increased and stabilized industrial loads resulted. He recently returned from a mission to Europe.

F. O. HESS

MERIT AWARD

Grove Lawrence, head of the Butadiene Production Department of Southern California Gas Co., Los Angeles, was awarded the Merit Award for outstanding achievement in accident prevention, in a presentation at the A.G.A. convention last month. Among 709 employees of the department, a total of 1,020,000 man hours was recorded without a single disabling accident.

The period in which the mark was made extended from Aug. 1, 1945, to April 7, 1946.

counted by John J. Novy, assistant to the vice president of Peoples. New pipe line capacity is urgently needed now to meet expanding demand and winter peaks in the Chicago area; and it has been necessary for the Peoples company to deny applications for new house heating as well as industrial loads until more gas can be piped into the system from the natural gas producing fields.

Keynote of the many papers, discussions, lectures and forums on various aspects of gas and appliance merchandise and merchandising was the warning, oft repeated, that the present sellers' market can be expected to last only until manufacturers' output begins to catch up with consumer demand. Ways of meeting the selling problems that will arise with the recurrence of the normal buyers' market were stressed in many meetings.

Salesmen and sales executives who had ample opportunity to acquaint themselves with the many new and improved appliances on display in the Gas Appliance Manufacturers Association exhibit in the municipal auditorium were cautioned that as attractive as all the equipment might appear to be, it would never sell itself in anything like the volume necessary to keep gas abreast of the competition from electricity and other fuels.

Home service experts, in an open meeting and at their traditional annual Home Service Breakfast, reported on the domestic demand and ways of meeting it as seen from the housewife's viewpoint. Edwina Nolan, Bendix Home Appliances, Inc., quoted a survey showing that 61.5% of the nation's homemakers do all their own laundry while only 3.4% send all their laundry out. The need for more adequate quantities of hot water to take care of this and other household demands was further emphasized by W. J. Schmidt, Long Island Lighting Co., who read a paper "Importance of Hot Water Promotion."

Elizabeth Lynahan, Peoples Gas Light and Coke Co., Chicago, home service director, discussed in detail the expanding needs for hot water in the modern home not only for the laundry, but in automatic dishwashers, for the thawing of frozen foods and in connection with other innovations.

Elmer W. Cone, Ruud Manufacturing Co., in his "Cold Cash for Hot Water" talk, stressed the profit opportunity in selling adequate water heating capacity to every gas-using home. Cone punctuated his points by occasionally throwing a handful of coins out into the audience, a gesture that provoked lively interest among the occupants of the first dozen rows.

"Fourth Zone" Oven

One cooking appliance, a newly patented steam oven, received more than average attention and was the the subject of a descriptive paper by C. C. Young, research engineer of the Gas Service Co., Kansas City, Mo. Steam oven cooking, referred to as "fourth zone" cooking by its advocates, is a method whereby food that would ordinarily be boiled on top of the stove is cooked in a sealed oven in the presence of low pressure steam. Advantages claimed are that this method preserves vitamins and minerals in the food being cooked, and at the same time produces a more appetizing finished product.

Industry promotional activities that have been running in many instances since before the war were presented again by their practitioners. These in-

SAN FRANCISCO IN 1947

San Francisco, Sept. 29 to Oct. 3, 1947—the recommendation of the Time and Place Committee—was the unanimous choice for the 29th annual A.G.A. convention, in a vote taken among members attending the Atlantic City meeting.

Next year will mark the first Pacific Coast convention. The 1942 event was scheduled for San Francisco, but war conditions prevented its being held.

Harold Massey, assistant managing director, Gas Appliance Manufacturers Association, has stated that there will be no appliance exhibit at the 1947 convention.

Nils T. Sellman headed the committee.

McCALL MAGAZINE AWARD WINNERS FOR 1946

Second

VIVIAN MARSHALL
Home Service Dir.
New Orleans (La.)
Public Service Co.

Third

J. A. BELL
Kitchen Consultant
Alabama Gas Co.,
Montgomery

The Award

The Winner

J. W. LEA
Sales Manager
Atlanta Gas Light Co.
Atlanta, Ga.

Fourth

MARGUERITE FENNER
Home Service Dir.
Pacific Gas & Electric Co.
San Francisco

Fifth

JEAN HARRISON
Kitchen Consultant
Mpls. Gas Light Co.
Minneapolis, Minn.

First prize of $150 went to J. W. Lea, the plaque to his company. Prizes were based on papers of 2000 words or less submitted by the entrants, and covering the following points: The plan developed by the company as a means of helping housewives to plan better kitchens; the means used; the progress made; and a summary of the accomplishments.

Lea's paper described the Atlanta kitchen campaign built around the "House of Blue Flame."

Miss Marshall's paper described the home planning center used in New Orleans, and gas promotion as projected in her column in a New Orleans paper. Atlanta's "New Freedom Kitchen Bureau," into which was tied strong newspaper, radio, and window display advertising, was described by Jack Bell. A slide lecture which was presented 324 times to a total of 14,000 women was part of the program which won fourth prize for Miss Fenner. Coordination of functions of sales department, local architects, bankers, contractors, and mortgage loan companies, by Minneapolis' Kitchen Planning Department was submitted by Mrs. Harrison.

clude the New Freedom Gas Kitchen Bureau, an A.G.A. headquarters activity, and the "CP" range campaign, which is financed by stove manufacturers who are members of GAMA. E. Carl Sorby, vice president of the George D. Roper Corp., predicted that in the latter campaign increasing stress would be laid on fully automatic gas cooking, which practically necessitates the use of a range built to "CP" standards.

Increasing commercial and industrial uses for gas were predicted in papers and addresses presented by various speakers including W. M. Jacobs, manager of general sales, Southern California Gas Co., Los Angeles; Leon Ourusoff, manager of the utilization department of the Washington (D.C.) Gas Light Co.; L. S. Reagan, The Webster Engineering Co., and others.

The full slate of new A.G.A. officers as presented by the nominating committee was adopted by vote in the first general session.

HERO HONORED POSTHUMOUSLY

John Kmetz, former chief transmission system operator of the Consumers Power Co., Saginaw, Mich., was posthumously awarded the American Gas Association's Meritorious Service Medal in a brief but eloquently expressive service before industry representatives assembled in general session of the annual convention in Atlantic City, on Wednesday, Oct. 9.

In handing the medal and the certificate accompanying it to Mrs. Kmetz, widow of the gas industry hero, President Everett J. Boothby recounted the act of unprecedented personal bravery and self sacrifice that resulted in his death. On May 30, 1945, Mr. Kmetz was working as an inspector on a high pressure pipe line maintenance job when gas escaping from a break in the line, under 300 lbs. pressure, became ignited. Caught in the path of the flame, his clothes practically consumed by the blast, he paused only to smear his seared flesh with mud from a nearby ditch, then got into his car and drove over seven miles to shut off gas on either side of the main to divert the flow into other lines. Flesh from his hands was found on the steering wheel of his car after he had driven to the hospital upon completion of his agonizing and heroic mission. He died as a result of his burns on June 4, 1945.

148 Trillion Cubic Feet

By N. C. McGOWEN
Committee Chairman

A.G.A. COMMITTEE GIVES FIRST REPORT ON NATION'S NATURAL GAS RESERVES

THE importance of natural gas and natural gas liquids to our entire economy has received growing recognition for a number of years, but the recent war emergency served to emphasize even more the vital part they play in our national life. Accompanying this recognition has come realization of the necessity for taking periodic stock of these natural resources. In view of this, the directors of the American Gas Association, at the suggestion of its Natural Gas Department, authorized in 1945 the formation of the "Committee on Natural Gas Reserves." Its function was to be the preparation of reliable annual estimates of the proved reserves in the United States of natural gas and its derived liquids. In compiling and publishing these figures, it was thought that the association would be rendering a service to the industry and the general public.

At their first meeting in October, 1945, the committee members decided that each would submit the reserve estimate of an assigned district. It was thought that this could best be accomplished if each member were to act as chairman of subcommittees consisting of individuals familiar with the natural gas occurrences within their local areas. In pursuance of this, the committeemen invited the aid of men experienced in the estimation of reserves. Up to the present time, the 54 geologists and engineers listed in the accompanying statement have cooperated in this work.

First Estimate

The committee herewith presents its first estimate of the natural gas reserves of the United States. As chairman, I wish to express my appreciation and give full credit to those men who were responsible for contributing their time and efforts to its preparation. I would also like to thank the many companies and individuals throughout the country who made available their data and records. In many instances information was given to the committee on the basis of strictest confidence.

We find that the total proved recoverable reserves of natural gas in the United States as of Dec. 31, 1945, were approximately 148 trillion cu. ft. These reserves are found in three types of occurrence:

(1) Non-Associated gas (free gas not in contact with crude oil in the reservoir). 111 Trillion cu. ft.

(2) Associated gas (free gas in immediate contact with crude oil in the reservoir). 20 Trillion cu. ft.

THE COMMITTEE

N. C. McGOWEN, United Gas Pipe Line Co., Shreveport, La., (Chairman).

LYON F. TERRY, Chase National Bank, New York, (Vice Chairman).

PERRY OLCOTT, Humble Oil and Refining Co., Houston.

R. M. BAUER, Southern California Gas Co., Los Angeles.

E. E. ROTH, Columbia Engineering Corp., Pittsburgh, Pa.

CHARLES C. HOFFMAN, Cities Service Gas Co., Oklahoma City.

R. O. GARRETT, Arkansas Louisiana Gas Co., Little Rock, Ark.

W. T. NIGHTINGALE, Mountain Fuel Supply Co., Salt Lake City, Utah.

FREDERICK S. LOTT, Petroleum Economics Div., Bureau of Mines.

WALTER E. CAINE, chief statistician, A.G.A.

N. C. McGowen

(3) Dissolved gas (gas in solution in crude oil in the reservoir) 17 trillion cu. ft.

A breakdown of these figures by states is submitted in the table. All volumes were calculated at a pressure base of 14.65 psia, and at a standard temperature of 60° F. The recovery factors and abandonment conditions assumed in the individual fields differ as widely as the characteristic circumstances in each field.

We are cooperating with the Committee on Petroleum Reserves of the American Petroleum Institute, whose annual published oil estimates have been well recognized and accepted since 1935. Dr. F. H. Lahee, chairman, and other members and subcommittee members of that group have been extremely helpful in coordinating their work with ours. As a matter of fact, the reserves herein classified as dissolved gas have been estimated to a large degree by that group.

Natural Gas Liquids Excluded

Those light hydrocarbon liquids which are gaseous in the reservoir but liquefiable at atmospheric pressure and temperature are not included in this estimate. Natural gasoline, condensate, various plant products and liquefied petroleum gases fall in this category. Both committees have agreed to group these lighter liquids, which are not crude oils, under the term "natural gas liquids." It is planned to include an estimate of the reserves of these liquids in our annual report for Dec. 31, 1946.

ESTIMATED PROVED RECOVERABLE NATURAL GAS RESERVES
As of December 31, 1945

States	Gas Reserves in Millions of Cubic Feet			
	Non-Associated	Associated	Dissolved	Total
Alabama	.....	.....	23	23
Arkansas	494,866	149,471	225,349	869,686
California	3,653,704	3,091,952	4,110,051	10,855,707
Colorado	158,422	126,783	111,077	396,282
Florida	.....	.....	6	6
Illinois	3,000	55,000	210,000	268,000
Indiana	4,000	8,000	5,000	17,000
Kansas	12,825,868	218,984	205,753	13,250,605
Kentucky	1,336,800	.....	100,000	1,436,800
Louisiana	16,043,932	2,650,000	1,154,600	19,849,393
Michigan	5,431	.....	3,500	8,931
Mississippi	1,621,382	270,332	116,145	2,007,859
Missouri	10	.....	60	70
Montana	1,202,521	.....	.....	1,202,521
Nebraska	.....	.....	375	375
New Mexico	2,680,133	1,930,300	579,876	5,190,309
New York	75,000	.....	1,000	76,000
Ohio	581,800	.....	45,000	626,800
Oklahoma	7,716,351	1,138,767	1,224,820	10,079,938
Pennsylvania	465,000	.....	55,000	520,000
Texas	59,381,205	10,316,402	8,609,069	78,306,676
Utah	81,323	.....	.....	81,323
West Virginia	1,818,300	.....	110,000	1,928,300
Wyoming	565,306	164,507	86,950	816,763
Total	**110,714,354**	**20,121,359**	**16,953,654**	**147,789,367**

Volumes are reported at a pressure base of 14.65 Psia, and at a standard temperature of 60° F.
"Non-Associated" includes all free gas not in contact with crude oil in the reservoir.
"Associated" includes all free gas in immediate contact with crude oil in the reservoir.
"Dissolved" includes all gas in solution in crude oil in the reservoir. The estimates for this gas were based on the figures of the API Committee on Petroleum Reserves and were estimated jointly by the A.G.A. and the API reserves committees.

Our committee expects to investigate the natural gas and natural gas liquid reserves as of Dec. 31 of each year and to report these figures early in the following year. Annual production figures will be included.

A.G.A. Resolutions Ask Allocation of Pipe, Continuation of Research

RESOLUTIONS recommending that the government be asked to allocate "adequate" steel pipe and other iron and steel products to assure a sufficient supply to equip veterans' housing programs; that the Special Research and Promotion Plan Fund be extended beyond this, its third and last year; and that the Bureau of Mines be requested to resume technical studies in the gas field which were interrupted by the war, were passed at the A.G.A. Atlantic City convention.

The resolutions said, in part:

Veterans Program Needs

WHEREAS: The Government of the United States of America has embarked upon a program designed to provide housing for several million war veterans and has established certain restrictions on the uses of materials to assure the completion of such program, and

WHEREAS: The gas utility industry will be called upon, in due course, to supply many of the homes so constructed with gas utility service, and

WHEREAS: The existing shortage of iron and steel products has caused the Government of the United States to reinstitute certain war priorities with regard to steel products . . . and

WHEREAS: The gas utility industry is not now in a classification which would entitle it to apply priorities in the acquisition of necessary pipe and other iron and steel products

NOW, THEREFORE, BE IT RESOLVED: That the proper officers of the American Gas Association be and hereby are directed to call the attention of the proper officers of the United States Government to this important matter and to the difficulties that will face the gas utility and the hardships which will be visited immediately upon veteran occupants of government-approved housing projects, and other customers dependent on it for service, unless, in connection with any control of materials which may be established or maintained, appropriate steps are taken by the Government to assure the gas utility industry of an adequate allocation.

Research Plan

WHEREAS: The Special Research and Promotion Fund plan of the association is now in the third and last year for which it was subscribed by the gas utility companies, and

WHEREAS: It is very evident that three years of such a program cannot allow of the completion of all projects . . . now, therefore

BE IT RESOLVED: That this Convention endorse wholeheartedly the continuation of this Special Research and Promotion Plan and urge the officers and directors of the association to make provisions for its extension.

Bureau of Mines Studies

WHEREAS: The natural gas industry has a basic purpose in the national economy of producing and transporting natural gas and providing means for its better utilization, and,

WHEREAS: The Bureau of Mines of the United States Department of the Interior, through basic and engineering research has aided the natural gas industry effectively in carrying out its major purpose and in advancing its objectives, and the Bureau has coordinated organization well qualified to undertake technical research having nationwide importance and application . . .

NOW, THEREFORE, BE IT RESOLVED: That the Secretary of the Interior be requested to have the Bureau of Mines resume technical studies interrupted by the recent war, and engage actively in an enlarged coordinated program of natural gas research.

Why Louisiana Wants to Keep Its Natural Gas

By P. A. FRYE,

Executive Director of Natural Gas Conservation of the State of Louisiana.

SO widespread has been the misunderstanding of Louisiana's position with regard to its remaining reserves of natural gas, as expressed by formal resolution of her legislature and by her authorized representatives at hearings before the Federal Power Commission, that recently when the editor of GAS so generously tendered me space in his columns for a clarification of our policy, I gratefully accepted his offer.

I am not so naive as to believe that all of the misapprehensions which surround the subject are inherent in it, but I rather suspect that some of our friends of the pipe line industry have deliberately injected certain extraneous issues—for what purpose and with what intent, the reader's guess is as good as mine.

In considering Louisiana's position, certain fundamental facts should be kept in mind. Louisiana has no mineral fuel resources other than gas and oil. It has no coal and no waterpower, either developed or potential. Thirty-four of the 48 states have coal, and 45 of the 48 produce waterpower. Approximately 50% of Louisiana's present marketed production of natural gas is leaving the state, much of it going into the heart of the largest and most prolific coal fields of the world.

The facts are largely matters of undisputed statistical data which have been placed on record before the Federal Power Commission in its nation-wide Natural Gas Investigation, Docket G-580, which covers all phases of the industry from the time the gas leaves the reservoir of the earth to the time it reaches the stage of combustion in some of its manifold utilizations.

The conclusions which are to be drawn from those facts, however, are the subject of bitter dispute between those (1) who hold that there is a large amount of eco-

nomic waste in the present utilization of natural gas, particularly in some of the industrial processes, and who advocate a more stringent regulation of the end uses of this gas by the Federal Power Commission, through an amendment to the Natural Gas act if necessary; and (2) those who hold that the law of supply and demand and recognized competitive factors should be the sole criteria applied to end uses.

The conclusions, which become the laborious and thankless job of the Federal Power Commission to draw from the established facts, cover a wide range of human experience, for they bring into issue questions of geology, engineering, chemical research, finance, marketing, and, as well, involve the social question of the well-being of millions of people and their dependents.

What Resolution 7 Says

Local public interest in this question was precipitated by the adoption of Senate Concurrent Resolution No. 7 by the Louisiana Legislature of 1942. I shall not reproduce the resolution here, but it refers to the fact that according to federal authorities natural gas constitutes but 0.1% of the nation's mineral fuel reserves, in terms of British thermal units, and that coal constitutes 98.9% of those reserves; it refers with commendation to the report of the Federal Power Commission to the Congress for 1940 and the apprehension therein expressed over the increasing rate of natural gas withdrawals from the reservoirs of the Southwest, and wherein it questions the economic wisdom of the withdrawal of such vast volumes of gas and its transmission for long distances to coal mining areas where it competes with coal. The legislature expressed the opinion that "the accelerated depletion of the natural gas reserves of Louisiana will constitute a most serious handicap and bar to the normal industrial development of the state. . . ." and directed that appropriate state agencies take all necessary measures to oppose applications before the power commission to construct additional pipe lines from the Louisiana fields to areas amply supplied with other forms of fuel or energy resources.

In justice to the Louisiana Legislature and those officials of the state who are charged with carrying out the legislative mandate, it should be made crystal clear at the inception that this move to put the state's future exportations of her dwindling gas reserves, in some measure at least, on a selective or functional basis instead of upon a basis of mere desire for the gas and ability to pay therefor, is actuated in no sense by a dog-in-the-manger attitude. Nor, is it in any manner predicated upon a desire to interfere with the movement in interstate commerce of a commodity suited in all respects to such commerce save that it exists, in Louisiana at least, in limited quantity, relatively speaking.

Property of the People

Opposition to additional exportation to the coal bearing states is further predicated upon the fact that natural gas is a wasting and irreplaceable natural resource; in the reservoirs in the earth in Louisiana, it is not the property of any individual or pipe line company holding title to the land, but rather it is the property of all the people of the state, who should have some voice in its disposition. This doctrine has been affirmed by the courts, federal and state (Summers on Oil & Gas).

The attitude is by no means one of mere caprice—rather, it is based upon the profound conviction that the time has come, if indeed it is not overdue, when the interests of the state and nation demand that the remaining reserves be wisely conserved and that they be utilized in economically and socially justifiable ends.

The conservation of natural gas through the elimination of physical waste at the points of production is, of course, a matter which addresses itself to the several producing states; the matter of conservation through the regulation of end use — functionally rather than geographically — is a matter that addresses itself to the Federal Power Commission, as to that gas moving in interstate commerce.

To put it baldly and bluntly, to pipe gas from Texas or Louisiana to the coal-producing areas of West Virginia or Pennsylvania to be burned under a boiler to generate steam is to my mind an economic absurdity. True, it is a more convenient fuel than coal, and if the gas reserves were as plentiful in terms of Btu's as those of coal, the argument in favor of its more stringent conservation would perhaps lose much of its force.

Louisiana has never yet lifted its voice in protest against the exportation of her gas to the people of other areas situated as she is, without coal or water-power within easy economic reach.

To gain a fair conception of the basic reasons underlying Louisiana's objection to the proposals of the great pipe line companies to increase their exportation of her gas to the great coal producing states of the Appalachian region, it is necessary to review, in a paragraph or two, some of the state's past economic history.

Louisiana, in common with the South generally, has for generations suffered from an unbalanced economy, in that the agricultural and extractive industries have heavily predominated. Returns to workers in these industries, as compared with the returns to workers in manufacturing or processing industries, have been, since the very dawn of the industrial age, notoriously low —except during abnormal periods such as we are now experiencing, when the demand for agricultural commodities exceeds the available supply.

Per Capita Income

The Statistical Register of the United States for 1944-45, published by the Department of Commerce, shows that in 1939 — the last normal year — the per capita income in Connecticut was $764. Connecticut is typical of the highly industrialized states but without natural resources or raw materials native to the state. The per capita income in Louisiana, a more or less typical southern state in which the agricultural and extractive industries predominate, was for that year $354. In 1943, when the war industries were getting under full sway, the respective figures in the two states were $1452 and $714. The average of the entire United States for the two years was $539 and $1031.

Now, despite her vast wealth of natural resources and raw materials suitable for manufacturing or processing, Louisiana's output of manufactured goods, other than petroleum products and lumber, is and always has been distressingly low.

There have ben many and diverse causes for this unfortunate condition under which the state's natural resources have been largely exported to other areas, there to be manufactured or processed. The consequent increase in wealth, added by manufacture, thereupon flowed to the distant states where the manufacturing was done, rather than to Louisiana, the place of nativity of the raw materials.

The exportation of Louisiana's natural gas was, and is, one factor in this undesirable situation, or was just one more of a long list of the state's natural resources being exported in their original form to other areas for processing or manufacturing or other utilization.

At about the time that the 1940 report of the Federal Power Commission to Congress was made public, with its startling revelations as to the economic and physical waste of one of the nation's most valuable and irreplaceable natural resources, the report and findings of the Interstate Commerce Commission in the first phase of the so-called

"southern governors' rate cases," in which Louisiana was one of the original complainants, was handed down.

I shall make a brief reference to that case, for it does, I think, bear a relationship to the natural gas controversy.

The decision of the ICC in that case sustained the contentions of the South as to the individual commodities involved, but, more than that, it outlawed the character of discrimination under which the South had long been complaining.

Generally, the contention of the South was that it was suffering and had for decades suffered from a system of discriminatory freight rates, under which its raw materials and natural resources were being drawn off to the heavily industrialized states of the North and East, and the products made therefrom shipped to many competitive markets at lesser rates mile per mile than the same manufactured commodities could be shipped if made in and moved from the South to these markets; or at lesser rates than such manufactured commodities could be shipped between points within the South.

The Interstate Commerce Commission, in its decisions, found no warrant in law for such discriminatory practices and ordered the rates equalized mile for mile. The South could and did ask for no more. That case involved only "commodity" rates. After the decision in that case, the Southern states, including Louisiana, caused to be instituted a similar proceeding involving "class" rates, on which move the higher rated, higher priced, manufactured articles of all kinds. Again the contentions of the South were sustained, and though the case is now in the Supreme Court of the United States on the appeal of the governors of nine northern and eastern industrial states, there is, I think, but little likelihood of the ICC decision being reversed.

I had a direct interest in these rate cases, having represented the State of Louisiana throughout the proceedings.

Industrialization-Conservation Tie-In

The fact that the report of the Federal Power Commission to Congress and that of the ICC were largely synchronous in time, though involving different jurisdictions and, on the face of the papers, unrelated subjects, was, of course, pure coincidence, but the thought occurred to me at the time, and it still persists, that the relation between the greater degree of industrialization in Louisiana hoped for and expected as a result of the decision of the ICC and the conservation and wiser utilization of our natural gas resources, which we seek in the investigation now before the Federal Power Commission, is far more intimate than merely casual.

By no means all the poverty, illiteracy, and social blights of various forms, which have been identified with the South for generations, are wholly attributable to the maladjustment in her freight rate structure; but that this maladjustment has been a contributing factor has, I think, been the conclusion reached by most economists who have studied the subject.

Proper Rate Differentials

Now, let us examine a little more closely the relationship between natural gas and freight rates.

It is axiomatic that a railroad will, and properly should, charge a greater rate for a given distance for hauling a car of high grade furniture than for hauling, for the same distance, the logs of which that furniture is made.

A carrier will charge more for the hauling of a carload of glazed tile a given distance than it will for hauling a car of clay, out of which the tile is made, the same distance. Though the products are basically the same, in the case of tile a value had been added by manufacture, and the carriers' risk in transporting it is greater and the value of the service is greater.

Now, it is just as axiomatic, I think, that a well-rounded industrial program for a state, many of whose native raw materials are of a type which require the direct application of large amounts of heat in connection with their processing, have available not only the raw materials to be processed but dependable supplies of fuel within economic reach of the materials to be processed.

In the G-580 case, Mr. H. R. Bodemuller, Industrial Engineer for the Department of Commerce and Industry of the State of Louisiana, testified that the principal natural resources of Louisiana, were timber, shells, salt, sulphur, crude petroleum, and natural gas, and that there had been substantial development in the industrial chemical field in the state, particularly since 1940; that the potentialities in this field in the state are vast, but "are limited by our ability to retain our reserves of gas. We need gas both as a chemical and as a fuel." . . . for "natural gas is not only the perfect complement to our mineral wealth, but the necessary item for making more valuable our existing reserves of timber, glass, sands, and clays"; "that in the production of sulphur natural gas is an all important item, and that while but one sulphur deposit is being presently worked, there are seven known potential deposits in the state."

FOR 16 YEARS Col. Frye, as he is universally known, has occupied various positions with his state, serving continuously under eight governors since December 1930. He has been successively: secretary and executive officer of the Louisiana Public Service Commission, special assistant to the Attorney General, and Director of Public Service; and his present post is that of Executive Director of Natural Gas Conservation by appointment of the present governor, Jimmie H. Davis.

P. A. Frye

Col. Frye was Louisiana's representative in the lengthy Southern Governors' Freight Rate Proceedings before the Interstate Commerce Commission, from 1936 until the final order—a southern victory—was rendered in May 1945.

He has represented Louisiana in several important proceedings before the Federal Power Commission, among them being: The United Gas Pipe Line Co. case; the Interstate Natural Gas Co. case; Tennessee Gas and Transmission Co. and the Memphis Natural Gas Co. hearings.

Heat, as is well known, is essential in the production of glass, and in large volume. Natural gas is the preferred fuel. In fact, it was testified in the Natural Gas Investigation by a representative of the Libbey-Owens-Ford Co., one of the leading glass producers of the country, that it was essential that his company's plants be located where natural gas was available in dependable volume almost irrespective of other factors.

Louisiana has great quantities of glass sand within easy economic reach; it has the natural gas; it has one of the largest plants in the country today for the production of soda ash, the Solvay Process Co. at Baton Rouge; and soda ash is a must ingredient in glass manufacture. Her supply of shells, for the production of lime, is almost inexhaustible and, unlike natural gas, is being constantly replenished. Here again, direct heat must be applied to the raw material and a reasonably priced, dependable source of native fuel is a prerequisite to establishing the industry on a footing commensurate with the available supply of raw material and the market for the finished product.

5000 Synthetics

As valuable as gas is as a fuel, it seems to me that this phase of its value is overshadowed by its value as the basic ingredient of a host of synthetic, chemical, and other products.

Dr. Gustav Egloff, one of the world's foremost authorities on the utilization

of petroleum hydrocarbons, estimates that there are more than 5000 synthetics capable of being produced from natural gas. Of all these, the production of synthetic rubber, in addition to being the most valuable contribution of the long list, is surrounded by the most dramatic features, for its production on a commercial scale was synchronized with the time of our most critical need of it for military purposes. In any event, I doubt that ever again will this country gamble the mobility and effectiveness of its automotive fleet on natural rubber produced in areas under the domination of powers other than ourselves, possibly not over-friendly, and half a world away. The risk, I think, is too great.

In natural gas hydrocarbons, we have the basic ingredient of synthetic rubber. We have in Louisiana, as well, the other essential requirements of a tire — carbon black, sulphur, cotton, and rayon raw materials.

The extraction of the gasoline content from "wet" natural gas is a process that has been in use for some years, but in order to be economically practicable, it is necessary that the raw gas contain a certain minimum amount of liquid hydrocarbons. The stripped gas is then usually returned to its reservoir in the earth to be withdrawn for pipe line purposes in the future.

The manufacture of gasoline and other petroleum products from a chemical and mechanical processing of natural gas is more or less in its infancy at this time, but it gives promise of supplying us with motor fuel to supplement the normal sources of petroleum, which seem to be waning at a disconcerting, if not an alarming, rate.

Conversion Research Under Way

Evidently, the petroleum industry is of the opinion that it is not too early to begin research in the quest for new sources of gasoline, for the Standard Oil Co. of New Jersey at its Baton Rouge refinery has just completed a full scale pilot plant for the conversion of natural gas into gasoline.

Space will not permit a recitation of the long list of these chemical synthetics, but it is appropriate and in line with conservatism, I think, to say that in the not far distant future plastics of various kinds will in innumerable ways replace woods and metals, and in many instances have already done so. It is interesting to note that every basic material needed in the manufacture of plastics, except phenol, can be produced from natural gas.

Governor Davis of Louisiana testified in the Natural Gas Investigation. He said, in effect, that the best criterion that he knew for gauging the future was to review what had happened in the past. He testified that when Bienville first landed on the soil of what is now Louisiana, the area was practically an unbroken forest, and that these immense areas of both hardwoods and softwoods were today, relaitvely speaking, denuded; that this denuding process had brought in its wake immense fortunes for the few, and a standard of living for the many barely above a mere subsistence level, and that "from this has flowed many evil social and economic consequences."

The governor's testimony and exhibits depicted the denuding of Louisiana's once great forests, and covered the years 1920 and 1943. The lumber industry was at its height in Louisiana in 1920, while by 1943 its decline was appalling.

The governor told of a certain 18 parishes in Louisiana (known as counties in other states) having an aggregate of 7,263,007 acres, or roughly 23% of the total area of the state. Louisiana has a statute under which parishes which have total annual revenues of less than $30,000 from all sources, excluding the parish proportion of the gasoline tax and funds received from the federal government, shall have their alimonies supplemented from the general fund of the state treasury by an amount fixed by law. These 18 of the 64 parishes came within the purview of the act. They had once been prolific producers of lumber and forest products, and bonds for schools, roads, and other purposes were floated freely, based upon an assumed continuance of those diminishing and wasting assets. The 18 parishes in question in 1920 had a total assessed valuation of $193,887,735. In 1943, this figure had dropped to $97,001,888, a decrease of 49.9%. The greatest decrease in assessed value was in standing pine timber, from $22,891,000 to $289,500, or 98.7%, the pine land acreage being reduced from 835,576 to 45,776 acres.

Financial Chaos

Of course, the inevitable happened. The last stick of timber was felled; the saw mill whistle sounded for the last time; the tram railroads and other appurtenances were removed not only from the land but from the tax rolls; the out-of-state owners and operators pulled up and left for the virgin forests of the Pacific coast area, where, unless the people of that section have profited by our bitter and expensive lesson, they are repeating the process. But the bonds that were issued, based upon that once tremendously valuable natural resource, are still live and valid obligations of those parishes. Financial chaos came to most of them and default came to some.

I have no quarrel with the great pipe line companies, except a purely economic one. The opponents of the gas conservation program label it as a blow at free enterprise. The existence of a state of free enterprise is predicated upon free competition. There is little or no competition in the purchase of gas for long distance transmission, and because of the inherent characteristics of the commodity there can be none, for it must be moved by pipe line or not at all.

I think that out of the welter of conflicting and confused opinions surrounding this subject, one conclusion, and only one, may be said to rest upon an uncontroverted and invariable law of physics; and that is the fact that sometime, somehow, we shall come to an end of our natural gas resources.

Despite this, however, the theme song of the pipe line companies in the general gas investigation seemed to be "It can't happen here," because new wells and new fields are being brought in more rapidly than old ones become exhausted. They fail to observe, however, that late new producers in South Louisiana have been primarily oil producers and not gas.

"It can't happen here," they say; but my answer is that it did happen here. The once prolific Richland parish gas field in North Louisiana is but a memory. The Monroe field in North Louisiana, at the time of its discovery, and for years thereafter, the largest in the world, is clearly and definitely on the wane and some of the pipe line companies who have depended on its "inexhaustibility" for years are at this time exploring other fields and other territories to bolster the dwindling supply remaining in that field.

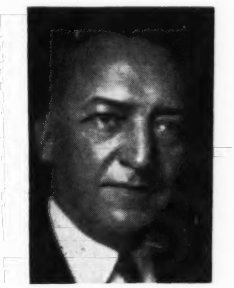
The Hungry War Machines

The war played cruel havoc with the natural resources of all the world, and nowhere was the process more active than here in the United States. The country has awakened to the fact that Minnesota's deposits of iron ore are, as are Montana's copper ores, not inexhaustible.

We believe that Louisiana's natural gas is destined to play a greater part in the industrial and chemical destinies of the nation than to serve as fuel under boilers sitting over coal mines in West Virginia or Pennsylvania.

The life of our remaining reserves in Louisiana, based upon the present rate of consumption, is variously estimated at from 20 to 35 years—hardly the life of an ordinary industrial bond issue, and certainly a short time in the life of a state.

The Gas Company's
EQUITY IN INDUSTRY



While domestic base loads are approaching the ultimate, sales for central heating are booming. To prevent spiraling costs resulting from this imbalance, the author advocates not discouraging central heating installations, but rather building an industrial load that will lower this expensive load—percentagewise.

By E. M. THARP,

Vice President and General Manager,
The Ohio Fuel Gas Co., Columbus, Ohio.

THERE are more challenging possibilities in the industrial market for gas than in any other field with which our industry has contact. These possibilities offer not only opportunities for reviewing, but for the balancing and stabilizing of operations which are so essential to the development of earnings. In addition, industry, with the sustaining advantages of gas service, provides a favorable economic atmosphere for the growth and maintenance of those other markets on which we must depend. In other words, our equity in industry is a basic interest vital to the rounding of our load curves and efficient development of full earning possibilities.

These are rather conclusive statements to begin with and deserve consideration of background by way of understanding them. Let us then begin by consideration of the fuel itself and its industrial applications. It must meet economically the competition of other fuels, since it is only by such advantage that we may be in a position to offer a service to take any permanent hold on the industrial market. Experience in establishing that gas has, within its utilization, inherent qualities that cannot be found in any other fuel. These inherent qualities, of course, have to be brought out through development and research and can be best utilized only if the heating process of any particular industry is built around this fuel.

Some of these inherent qualities which we have come to know may be briefly outlined as follows: Gas can be synchronized with processing industries with respect to time, speed and temperature so that the equipment and the fuel can be automatically mechanized exclusive of the human element, to the end that the resulting combined equipment is really another machine in the processing line of production.

Enters Into End-Product

Natural gas can be used not only as a heating agent on process work, but can also be automatically re-formed so that the resultant gas can enter into the chemical or metallurgical action necessary to produce the desired product. An example of this is the carburizing of steel, where the carbon from natural gas is infused into the surface of the steel so that the outer surface may be extra hard and have tough wearing qualities. Or, as another example, the gas can be re-formed, the water vapor removed, and the resultant gas acts as a protective atmosphere for materials going through the furnace so that the surface of such materials does not become discolored or oxidized. This method is followed in the bright annealing of copper and steel. These inherent qualities make natural gas far more desirable than does just its fuel value alone. Natural gas can be burned at very high rates, releasing great amounts of heat over very small areas. Development along this line has increased the speed of heating materials so that today 10 times as much heat per cubic foot of space can be released than ever before thought possible. Natural gas therefore makes possible specialized heat applications which are impossible with any other fuel.

Gas Industry's Obligation

Obviously, such an extraordinary fuel has an essential character to progressive production in industry, and offers such economic implications as ability to pay higher wages, to create better working conditions, and at the same time to produce better and more products at less cost. As the gas industry makes such an outstanding tool available to general industry it necessarily incurs responsibility for continuity and adequacy of service, since industry must completely depend upon a service around which it has built its industrial heat applications to the exclusion of any other fuel. In the heat treating and chemical industries these applications have progressed to such an extent that operations are stopped cold whenever such natural gas supplies are not available.

While this places a heavy obligation on the part of the gas service, it affords an opportunity to evaluate such service at a price far above its value simply as a competitive fuel. Research toward better utilization of gas is going on in the heavy industries, such as steel, glass, oil, synthetics, etc., but ultimate development can be made possible only if equipment can be installed to utilize exclusively these inherent qualities of gas fuel. These extra-special gas values cannot be developed where gas is sold on an interruptible basis, as where gas is sold by that method its value is restricted to levels not nearly on a par with competitive fuels.

Presented at 28th annual convention, American Gas Association, Atlantic City, N. J., Oct. 7-11.

In the early days gas was sold competitively with coal and oil simply as a fuel, and usually its application was a crude installation, removable as supply conditions and prices changed the competitive relationship. Recognition of the extraordinary qualities of gas fuel was delayed for years because it was available only off peak. It is only as availability of gas for all-year service improved that its advantages of control, flexibility, and chemistry were developed, giving it an essential character for which today there is no substitute. These changes and improvements have been carried forward beyond the expectations of the customers who originally, more or less reluctantly, were persuaded to use gas for their fuel requirements, but also beyond the expectations of gas companies and equipment manufacturers who were urging gas installations.

Now while industry may find gas so desirable as a processing fuel, the question naturally arises as to whether such industrial markets are desirable to gas companies. In the case of our company, industrial load accounts for about 40% of total sales volume, with an 82% load factor. The load factor of our domestic and commercial sales is about 40% and house heating about 24%. It will be apparent that the industrial load raised our overall load factor to 50%. As house heating saturation increases and domestic load factor shifts from 40% toward 24%, the importance of compensating high load factor industrial sales becomes more pronounced.

Loads Are Complementary

It is certainly not correct or proper to say that our industrial load is the best load or more desirable than the base domestic load for cooking, water heating and refrigeration; rather it should be recognized that the domestic and industrial loads are complementary and the advantages derived from each reflect in favor of the other.

Surely, none of us need be reminded of the enormous volume of central heating load being connected to our systems and the problems with which we are confronted as a result. The unprecedented rate at which this load is being connected is partly due to our own promotional and sales effort of the past, but probably more directly traceable to the changing economic status of gas, because of increased earning power and spendable income and the increased prices and limited supplies of other fuels. If this be true of gas as a fuel for central heating purposes, then it must also be true in the industrial field. It may also be said that if the position of gas is improved in the economic fuel scale, more fields of industrial application are opened up. It would, therefore, seem to be a very propitious time to promote actively the sale of gas for industrial purposes.

Counterbalancing Heating Load

From where we stand today, it would seem that the sale of base load domestic gas per customer is approaching the ultimate. Our efforts in this field are now devoted to holding what we have against competition and attempting to equip all new homes with appliances and service for these base domestic purposes. While the gas industry is constantly growing in number of customers served, it would seem that unless and until people can be persuaded to do more home cooking and more home laundering, the gas sales per customer will not show any appreciable increase.

In the meantime, the sale of gas for central heating purposes is growing by leaps and bounds, and the sales for this purpose bid fair to equal or exceed those for purely domestic purposes. The current attitude so generally expressed in our industry of prohibiting or discouraging the installation of heating equipment cannot be held indefinitely, and our plans must contemplate the handling of this load in a satisfactory manner whether we like it or not. To minimize the effect of this load upon our investment and our operations, it is desirable to strike in two directions: First, to seek a compensating and balancing summer load; and second, to build our industrial load so that heating sales represent a lower proportion of the total sales.

Summer Load Prospects

The opportunities in the first direction are somewhat limited. The development of the Servel air conditioning unit seems to offer some possibilities, but time will be required before any appreciable load can result from this source. In the industrial field there are certain operations or processes that are carried on either completely or to a large extent during summer months. To mention a few, there are asphalt plants operated in conjunction with street construction and repair programs, hay driers, food dehydrating plants, food processing and canning factories. Except possibly in the southwest, there has been little work done by way of promoting the gas engine for industrial application. There is a field for this development, particularly in natural gas territory, for ice manufacturing plants and food locker plants, both of which experience summer peaks.

The opportunities in the second direction—building a year-round industrial load—seem almost unlimited, and it is not here necessary to dwell particularly on the theme. I would only point out that such load should be well diversified as between industries. Our business is bound to follow the general economy trend or cycle of business activity, but if the proper attention and effort are given to the diversity of industrial applications, our business in the industrial field need not follow the cycle of any particular industry or activity.

10 Cents vs. 34 Cents

Let us consider for a moment the probable differential in cost of service as between an industrial load and a house-heating load. Assuming a maximum load of 30 MMcf per day, and assuming further that the diversified industrial load would have a load factor of 80% while the house-heating load would have only a load factor of 24%, we could expect industrial sales of 8760 MMcf annually and house-heating sales of 2628 MMcf. If the cost of a manufactured gas plant is taken at $250 per thousand of daily capacity and this investment carries an overhead burden of 12%, the charge per thousand of industrial sales would be approximately 10 cents and against the house-heating sales about 34 cents.

If one operates a transmission system in connection with his operations, which represents an investment of $50,000 per million of daily capacity, and the overhead on this investment is taken at 10%, there would be a charge of 2 cents per thousand against industrial sales and 7 cents per thousand against house-heating sales.

Then we have a distribution system representing an investment of, say, $75,000 per million of daily capacity for domestic service. There probably is no distribution system which was constructed and operated entirely for industrial service, but this would be a much simpler and more economical layout than our normal distribution system, and it is here assumed that such a system would only represent an investment of $50,000 per million of daily capacity. Translating a 10% burden on these investments into gas rates, there would be a charge of 2 cents per thousand against industrial sales and 8 cents against house-heating sales.

Other Classes Penalized

Summing these up, we have a total charge of 14 cents per thousand against industrial sales and 49 cents against house-heating sales, or a differential of 35 cents per thousand in favor of in-

dustrial service. Generally speaking, we do not find such a differential in rates of these two services. It has been the policy of most companies to provide the lowest rate for house-heating service reasonably consistent with other rates. This, obviously, has meant that other classes of service have to some extent been penalized.

With the improved position of gas in the competitive fuel scale, we have the opportunity of re-examining our rate schedules and providing rates which will place upon each class of service its just proportion of cost. When this is done, bearing in mind the excellent load factor and stability of the industrial market, there would seem to be an opportunity of appreciable development and expansion of this service.

Geared to Gas

It is an accomplished fact that our industrial machine is geared to gas, and it is consequently dependent on gas fuel for continuing operations. In years past industry has used gas, seen the supply dwindle to a vanishing point, adjusted itself by conversion back to original fuels and gone its way again after suffering only temporary set backs, but present conditions are not analagous.

The last 25 years have evolved important changes. The development of methods designed to make the most of every potential advantage possessed by gas, both by concerted action on the part of our industry and by these industries themselves, has resulted in a condition which one cannot escape taking into full account in considering these matters.

Aids Mass Production

The fact that this is true has been beneficial to us as well as to our industries. Further than this it has been in the public interest. It has permitted the development and advancement of the art of metal working, glass making, and in other fields beyond points otherwise attainable. I would go so far as to say that no other single factor has contributed as much to making possible the quality mass production which is our pride as a nation. I would point out, as a significant fact, that no other country in the world developed (or was able to develop) in its industry this dependence on gas, and ask how large a bearing this one factor might have had in establishing our industrial supremacy and winning the war.

We are all familiar with the attempts made during the war to convert certain processes served by gas to other fuels and we know in how few cases this was found possible. So whether we like it or not, whether we agree that the part we might have played in this development was wise or not, it is nevertheless an incontrovertible fact that general industry is geared to and dependent upon gas—not necessarily our gas, but some gaseous fuel. We cannot escape the necessity of considering this fact in connection with our own problems.

Industry Would Wither

Whether we have a moral responsibility to industry to continue to serve its needs is quite beside the point. The facts we must consider are that our industries are dependent on gas and that the communities we serve are in turn dependent for their well-being on the retention and prosperity of these industries. The availability of gas at favorable competitive prices was a controlling factor in securing, developing, and expanding our local industries and community wealth, and prosperity followed as a natural result.

It isn't just a coincidence that we went through first a period when the use of gas by industry was expanded, and that now we are confronted with an unparalleled demand for gas for house-heating. What we are witnessing is nothing more or less than the workings of the sequence of cause and effect. I am perfectly well aware that we have just come through a war and that fact might have something to do with this flush of prosperity, but it was through industries such as our communities enjoy that the bulk of the money spent on the war was distributed. In the communities which we serve the amount distributed per capita was greater than the average for the country and this didn't just happen for no reason at all. It happened because our industries were set to do the job, and this in turn because they were geared to gas, the one factor that makes possible the optimum in quality mass production and for which today there is no known substitute. If we don't like operating in prosperous communities and would like to change these conditions, then the surest and quickest method we could employ would be to choke off our industries. Cut these supplies that are so vital to them, and in time, some quickly, some more slowly, they have no alternative but to retrench or move to localities where these needs can be supplied: and if this happens, the business of our community, our business, will never again be the same.

Chain Reaction

I am talking in generalities to save time. I am not developing this thought as carefully or completely as it deserves to be or as I would like to. The effect of gas curtailment or withdrawal will, of course, be greater in some plants or industries than others, but throughout our territory we would withdraw only an insignificant amount without setting up a chain of circumstances that might adversely affect all phases of our business. You cannot "eat your cake and have it too." House-heating load is luxury business. You can develop it only in parallel with or following the development of your industrial load, because this and prosperous communities are synonymous.

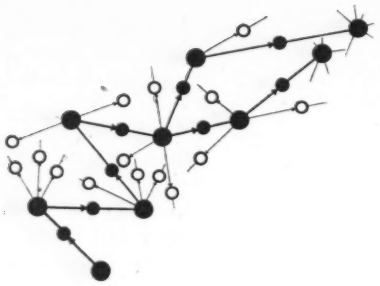
Don't Kill the Goose

If you are enjoying this free spending attitude on the part of your public and hope for its continuance, I want to point out that your industrial load has been and still is the goose that lays these golden eggs. There is a fable handed down to us that tells us of a man who tried to over-simplify his problem. He took the short cut and killed this goose to obtain immediately a lot of golden eggs. As I recall the story, he was not very successful and little children are taught not to consider him a particularly smart operator. I would suggest not only that you permit this goose to live, but that if you are interested in a high productivity of golden eggs, you feed her well.

Free, Unrestricted Growth

We have to accept our business as we happen to find it today with due recognition of the varied reasons and forces that have contributed to its present development. Perhaps we can't arbitrarily shift loads or load factors as we might wish to do. We have to be sure that whatever we do to effect these changes will not disturb the highly complex economic fabric upon which our business and communities are built. We have seen so much experimentation by others naive enough to believe they can artificially control some of the forces of an intricate economic structure to their own liking, and at the same time establish for themselves an immunity against disaster from the effects of the other forces involved, that we should not rush in and emulate them without mature thought.

I don't know whether readers will agree with my conclusions or not, but I feel we would do well to tread slowly in these matters that might disturb the balance as it exists, and that the real job is rather one of doing everything possible to arrange for free and unrestricted growth in every direction where profitable business is indicated.



ATOMIC POWER

Its Future as Industrial Fuel

By E. R. GILLILAND,

Professor of Chemical Engineering,
Massachusetts Institute of Technology

THE value of fuels such as wood, coal, oil, and natural gas lies chiefly in the fact that it is possible to produce heat from them. This heat can be used for the production of power, for carrying out industrial operations, and for industrial and domestic heating.

To the list of the older, conventional fuels there has now been added atomic energy, with potentialities which dwarf the resources of present fuels. While this new source of power may not completely displace older fuels such as wood, coal, oil, and natural gas, it is certain to reduce man's dependence on them.

It should be emphasized that all of these forms of energy, including atomic energy, are interchangeable, and that the choice of a particular form of fuel is dictated by a variety of factors including cost, convenience of utilization, location of supply, etc. However, any one of them can be used to produce the equivalent of any of the others.

The production of heat by atomic reactions has been demonstrated by the atomic bomb and by the uranium pile operations at Hanford, Wash., and today there can be no question about the possibility of producing heat by such reactions. Atomic reactions assure for the future an almost inexhaustible store of energy which can eventually make relatively unimportant, both geographically and quantitatively, the availability of common fuels.

Scientific Considerations

In the light of modern scientific discoveries the evidence is becoming conclusive that all energy production is based on the conversion of mass and that the Einstein relationship gives the proper mathematical evaluation. Thus, in the combustion of heat from coal, oil and gas, mass is turned into heat, but less than three parts out of 10 trillion are turned into heat and thus the energy production is relatively small.

In the case of atomic reactions the possibility of converting relatively large amounts of mass into energy are possible. There are a large number of such reactions, but in the present case, the discussion will be limited to uranium for which the conversion of mass into energy has been demonstrated on a large engineering scale.

Several of the other possible atomic power reactions have been demonstrated in the laboratory, but have not been carried to large scale application and therefore will not be considered in the present case.

3 Million to 1

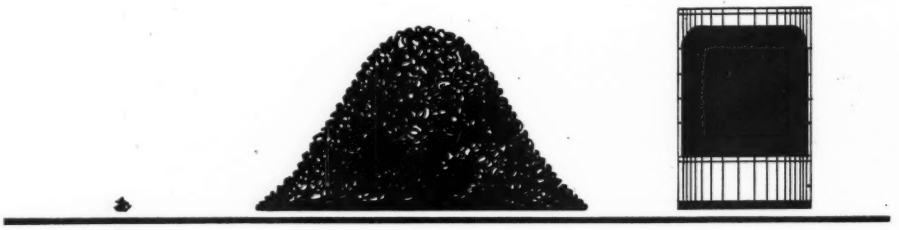
In the case of uranium "235," approximately 0.2% of the mass should be turned into heat upon decomposition and the large scale operations have indicated conversion of approximately 0.1% of the mass. Thus, 1 lb. of uranium when decomposed gives approximately three million times as much heat as would be produced from 1 lb. of coal.

In order to utilize this energy industrially, it is necessary to liberate the heat in a self-sustaining controlled reaction. For the case of uranium, this reaction has been carried out at Hanford, Wash.; Oak Ridge, Tenn.; and Argonne, Ill., as part of the Manhattan District project. These units have ranged from very small sizes producing heat equivalent to a few Btu's per hour up to a size that increased the temperature of the Columbia river from one to two degrees. Thus, the production of heat has been demonstrated for very small to very large units.

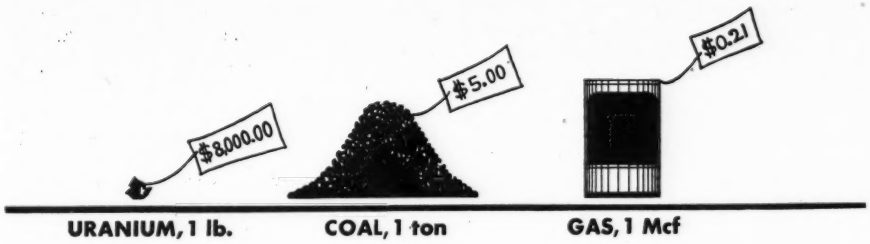
In the decomposition of 1 lb. of uranium, the heat produced is approximately 36 billion Btu's. One pound of coal on complete combustion gives approximately 12,000 Btu's and 1 Mcf of natural gas approximately 1 million Btu's. Thus, the decomposition of 1 lb. of uranium produces heat equivalent to three million lbs. of coal or 36 MMcf of natural gas.

Engineering Considerations

In the decomposition of uranium very high velocity particles are produced and by the pile operation these are slowed down with the production of heat. While the utilization of the kinetic energy of these high velocity particles is a possibility for power production, from an engineering viewpoint, it appears much more practical to convert them to heat by the usual pile operation and then utilize this heat with the conventional prime movers. Thus, the heat can be used for the production of steam which can be utilized in steam turbines or steam engines. Alternatively, the heat could be



"The decomposition of 1 lb. of uranium produces heat equivalent to 3 million lbs. of coal or 36 MMcf of natural gas."



"With coal at $5 a ton or natural gas at 21 cents per Mcf, on a heat basis 1 lb. of uranium decomposed would be worth $8000."

used in a gas turbine. The most practical method of using atomic power in the near future appears to be the production of heat which would then be utilized with the conventional type of power plant.

The production of heat by the atomic reaction has been demonstrated and the utilization of heat for the production of power is the present day method, but there are engineering problems in tying the two together. These problems can be summarized as:

1. **The temperature level at which the heat is produced by the atomic reaction.**
2. **Corrosion.**
3. **Radiation.**
4. **Re-working of uranium.**

In the production of heat for power utilization it is desirable to have a temperature of 500 to 1000° F., although power can be practically produced from heat at temperatures as low as even 200 to 300° F. In the uranium reaction two cases have been demonstrated on a large scale. First, the pile operation in which temperatures so far have been limited to 200° F. or below, and second, the atomic bomb which produced temperatures estimated to be greater than 1,000,000° F. For power production it would be desirable to have intermediate temperatures. In the case of the pile operation water has so far been the cooling medium and, since the purpose of these units was not power production, the scientists and engineers had no reason to complicate the operation by carrying the water under pressures which would be necessary to obtain sufficient cooling at temperatures higher than 200° F. From an engineering viewpoint, there does not appear to be any unsolvable problem of employing higher temperatures either by utilizing water under pressure or by using some other higher boiling fluid for the coolant which could then be used to boil water or heat air in a separate operation. The newspapers have recently announced that the Manhattan Project scientists and engineers have completed their design of a high temperature pile for power production and that construction is to begin in the near future.

Corrosion Problems

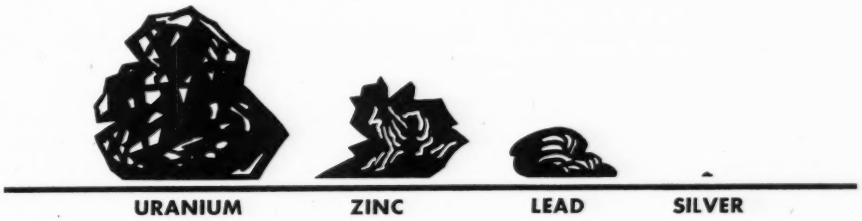
There are corrosion problems peculiar to the atomic power operations. These result from the fact that to obtain the most efficient operation it is desirable to avoid using some of the most common corrosion resistant metals of constructions. In addition, the physical properties of the metals within the atomic furnace may be altered by the bombardment of the high velocity particles. As a result of these two conditions, it is probable that the corrosion problems will be more difficult than in a present day power plant. This problem is being studied by a number of industrial and university laboratories, and suitable alloys should be soon available.

One of the most serious problems related to the use of any concentrated reaction of the atomic power type is the fact that extremely high velocity particles as well as radiations, including those of the X-Ray type, are produced. These high velocity particles and radiations are hazardous for plant and animal life and therefore must be absorbed or reflected before they come in contact with such life. To date the most practical method of stopping such radiation is by the use of a layer of concrete from three to eight feet in thickness. With such a shield between the pile and operators these hazards are eliminated. This is the technique that has been used at the large atomic pile operations at Hanford. The use of such shield limits the use of atomic power to heavy installations such as would be feasible for stationary power plants or large ships. Unless much lighter and less bulky methods of shielding are developed, atomic power as now known does not appear to be suitable for mobile power plants such as are used in automobiles and airplanes.

Another problem relating to uranium pile operation is the fact that the decomposition of the uranium produces elements which tend to interfere with the reaction and therefore periodically the material must be reworked to remove its impurities. These impurities are radioactive and their separation involves special chemical processes. However, practical processes have been developed and operated in connection with the Hanford pile. These by-products may be the source of real income since a large number of them are isotopes that have not been available before but which have extremely promising applications in medicine, research and industry.

Atomic Economics

In a previous section it was pointed out that the decomposition of one lb. of uranium gave a heat production equal to 3 million lbs. of coal or 36 MMcf. of natural gas. With coal at $5 a ton or natural gas at 21 cents per Mcf, on a heat basis one lb. of uranium decomposed would be worth $8000. While the cost of the heat alone is not a fair comparison, it does indicate the relative range, and after allowing for the new problems associated with atomic energy, it is probable that the cost per lb. on the uranium decomposed would have to be somewhere in the range of $4000 to $8000. It should be emphasized that there would be certain savings in such a case. Thus, the large coalpile and coal handling equipment could be eliminated. Accurate cost data are not available on the



"Uranium is . . . twice as plentiful as zinc, four times as plentiful as lead." It is also, according to Brason and Tarr's list, 20,000 times as plentiful as silver.

WHEN CONSIDERING conservation of natural gas, it is germane to discuss the possibilities of atomic power as a potential source of power that may one day consign other fuels to the limbo of the horse and buggy. Or that may not.

E. R. Gilliland

Just how practical the use of atomic power as an industrial fuel can be, and how soon according to expert estimates it will be available, are discussed in this paper, which the author presented at the final hearings in the FPC Natural Gas Investigation, on commission of the Natural Gas Industry Committee.

A native of Oklahoma, Dr. Gilliland earned his B. Sc. degree in chemical engineering at Illinois, his M. Sc. at Pennsylvania State College, and his doctorate at Massachusetts Institute of Technology. Since 1934 he has been on MIT's faculty, attaining full professorship in 1944. In 1945-46 he was deputy dean of engineering.

His achievements duuring the war included deputy chairmanship of Division 11, National Defense Research committee, and of the Joint Chief of Staff Guided Missile Committee, and chairmanship of the Jet Propulsion Panel of the Office of Field Service, OSRD. He has co-authored two books on chemical engineering and fractional distillation, and was for three years editor of "Chemical Reviews." A member of leading chemical societies, he won the Baekland Medal and Award for achievement in chemistry in 1944.

production of the active fissionable elements, but crude uranium costs less than $20 a lb., and a great deal of industrial processing can be carried out for a few thousand dollars per lb. Thus, the possibility of atomic energy being able to compete with industrial power at the present prices appears to be very real.

Atomic power units would have the very real advantage that they could be located wherever an adequate supply of cooling water was available. In special circumstances even air cooling would be feasible. The maximum size of an atomic power plant would be limited technically only by the amount of cooling available. It is interesting to note that the first large size atomic units at Hanford, Wash., had a heat production of the order of 3 billion Btu per hour. This heat liberation is somewhat more than that produced by the coal used in a 200,000 kw power plant, which is average size for large municipal units.

Future atomic units will undoubtedly be larger, and if desirable, could easily exceed the power output of the large hydroelectric dams in our Pacific northwest. Units of this size could be located in many localities in the United States. In fact, atomic power units are more adaptable to large units than to small ones.

A major consideration in the use of atomic power is, of course, the availability of the necessary materials for decomposition. It is therefore desirable to consider the availability of uranium. Brason and Tarr in "Introduction to Geology" McGraw-Hill, 2nd Edition, 1941, p. 6, state that the earth's crust is estimated to contain 0.008% uranium by weight. From the analysis of igneous rocks, these authors state that this composition is probably representative down to a depth of 30 miles. The amount of uranium this represents is tremendous. but instead of quoting the billions of billions of tons of materials in the earth's crust for a depth of 30 miles, it would probably be more instructive to give the comparable percentages for some of the more common metals. For example, the following table (from Brason and Tarr) lists a few of these:

Copper	0.01% of the earth's crust
Uranium	0.008
Zinc	0.004
Lead	0.002
Cobalt	0.001
Silver	0.0000004
Gold	0.0000001
Platinum	0.00000008

Thus it will be noted that uranium is almost as plentiful as copper, it is twice as plentiful as zinc, and four times as plentiful as lead. When one considers the enormous quantities of copper, zinc and lead that are being used and that have been used, it is apparent that the quantities of uranium are very great.

Besides the total availability it is also desirable to consider the concentrations of the material. The value of 0.008% for uranium corresponds to an average of 0.16 lbs. per ton of the earth's crust or about two Troy ounces. Since the distribution of uranium is not uniform there are large deposits in many countries that have concentrations three to four times this great. Six to eight ounces per ton may not sound very large, but it should be remembered that it is found economical to recover gold when the concentration is only one ounce per ton. A price of $50.00 per pound of uranium should make it profitable to work these large reserves and such a price for the original uranium material would not rule out the possibility of atomic power competing with coal at present prices.

The Time Scale

Estimating the time at which atomic power will be available is difficult because of the rapidly changing character of the field. A number of such estimates have been made by various engineers and scientists which in general range from five years to 25. It is significant that in general those who are most familiar with the field tend to give the shorter estimates. Smyth, in the government publication, "Atomic Energy for Military Purposes," states: "There is no immediate possibility of running cars with nuclear power or lighting houses with radioactive lamps, although there is a good possibility that nuclear power for special purposes could be developed within 10 years." The time scale is, of course, dependent upon the research and development effort that is applied in the field. We can be certain that such work will be very actively followed and encouraged by spectacular experimentation. It is interesting to note that early in June, 1946, the Manhattan District announced that the General Electric Co. had agreed to take a contract for the operation of the Hanford, Wash., pile for the specific purpose of developing practical atomic power units.

It is my opinion that atomic power units suitable for the propulsion of war ships will be available in less than 10 years. The development work on these units will be rushed because in this use, performance and not cost is the main criterion. The step from these units to large industrial plants will be relatively simple from an engineering viewpoint, and the timing is largely a matter of the relative costs of atomic energy as compared to conventional fuels. Even making a pessimistic estimate, it is difficult to foresee how practical industrial atomic power could be delayed as much as 50 years.

San Diego Gas & Electric Launches "Dealer News"

A brand new magazine — aimed at the salesman, dealer, wholesaler, and distributor—is the "Dealer News," announced recently by its publisher, San Diego (Calif.) Gas & Electric Co. Distributed free to all its potential readers throughout San Diego county, it will be presented monthly beginning with the September issue.

The motivating idea behind the new publication is to bring current stories of what dealers are doing—to present a "constant parade of successful sales ideas and techniques in local use," by which "we can make cash registers ring a little more often," according to A. E. Holloway, vice president in charge of sales.

Editor of "Dealer News" is Murray S. Holloway, Jr.

Utilities That Help Dealers HELP THEMSELVES

By H. C. GURNEY
Western Sales Manager,
Surface Combustion Corp., Toledo, Ohio

A growing number of gas utility companies are establishing genuine dealer participation plans to secure a broader distribution of gas appliances. This is a significant trend and no time is more propitious than the present for a gas company to consider its own policy in this respect. Later, it may prove exceedingly difficult to make changes in sales policies, but today gas companies are on the threshold of a new business era, unhindered by those merchandising policies to which they were committed prior to the war.

The extent to which dealer cooperation should go has long been a controversial subject in the industry. Prices of competitive fuels, consumer appreciation for gas services, attitude of dealers toward the gas company and a number of other varying local conditions are responsible for differences of opinion and for the impracticability of applying any one dealer cooperative plan generally.

Strong Allies Needed

Notwithstanding, most people are in agreement that the dealer will exert a strong influence, favorable or otherwise, on the sale of gas appliances. Those utilities which have developed acitve dealer participation are in a preferred position, for their own efforts will be substantially augmented by those of the dealers, and greater coverage of the market will be secured. They will have strong allies in the coming battle of the fuels.

Rules for guidance of the gas company setting up a workable plan of cooperation are well stated by the executive board of the American Gas Association in its recommendation on sales policies for gas utility companies.

The 12-point statement by the A.G.A. board, it will be recalled, included recommendations that the utility should perform the task of promoting the sale of new and approved gas appliances to the point of assured acceptance; as customer acceptance materializes, should continue its activities in a manner to increase the flow of gas appliance sales through normal channels of distribution; should initiate and promote appliance sales campaigns with cooperating gas appliance dealers.

Other Points Stressed

Other points in the board's statement covered the gas company's responsibility in training personnel, servicing equipment and in keeping dealers informed on products and merchandising opportunities. The entire statement deserves re-reading by gas companies which are establishing or improving cooperative dealer plans.

The building of a dealer organization requires the cultivation and development of existing dealers not only in the techniques of the sales application and installation of the equipment, but in such business matters as cost accounting, credit and collections, inventory control, selection and training of salesmen, and the formulation of compensation plans.

If satisfactory potential dealers are not available, then it may be necessary to interest outsiders of greater ability to enter the field. Fortunately, more capable merchandisers are being attracted by the potentialities of the gas heating market, although caution should be recommended in this respect until the supply of merchandise becomes more plentiful.

Important factors in a sound and healthy market for gas appliances, which will be the attraction to good merchandisers, are the trade practices, merchandising methods and quality standards employed; also an orderly market in which the various merchants can expect a legitimate profit and the public can expect a fair price.

A healthy market requires: that the selling prices established by the gas company be based on mark-ups which permit the dealers a normal profit; that no combination deals or trade-in allowances which are unprofitable for the dealers be considered; that no more attractive terms than those available for dealers be put forward.

A sensible compensation plan which will encourage cooperation, but not collusion, is essential to the success of the program.

The public should be informed that quality appliances purchased from authorized cooperative dealers will receive the same attention from the service or home department as equipment purchased from the gas company.

Benefits to Dealer

When a dealer becomes a party to the utility's cooperative program he stands to benefit from the increased advertising and promotional activities, from the improved quality and price level and from the improved trade practices. In accepting a part in this program he assumes a responsibility to the group and to the utility to support wholeheartedly the practices and activities established.

Far-sighted utility executives have accepted the fact that the primary responsibilities for the acceptance of gas as a fuel and the promotion of appliance uses is their own. They realize that their own complete withdrawal from either the selling and advertising or promotional activities would help neither themselves nor the dealers. It has been demonstrated many times that if the gas company simply steps out of the picture in the merchandising of gas appliances, the sales volume and the quality of equipment and installations decline because of competition factors and the lack of other sufficiently strong merchandising organizations.

Inferior Equipment Problem

The present demand for gas appliances provides an opportunity for an influx of inferior equipment whose major attraction is price and availability, the sort which lures installers of limited means and who have scant ability or interest in the substantial development of the gas appliance business. This situation is greatly aggravated at the present time when production of quality equipment does not keep pace with the demand.

Most gas companies are concerned over the adverse long term effect which inferior equipment in the homes of their customers will have. They are interested in initiating strong programs calculated to guide the growth of the business along lines which will protect their customers' interests and their own. So they will continue to advertise and promote and sell on a basis that develops the market. And they will aggressively work to develop a strong, well informed and profitable dealer organization.

Using Nordstrom Valves as PRESSURE

Increasing line pressure to meet growing demands poses many problems, among which some of the most important stem from pressure drops. Specially-constructed devices installed by the author on a Nordstrom valve reduced pressure drops to a safe minimum, and helped level out low-demand-high-pressure, high-demand-low-pressure characteristics.

By WILLIAM A. LaVIOLETTE,

Assistant Engineer, Department of Gas Operation, Pacific Gas and Electric Co.

DURING conditions of high volume demand every pound or even every ounce of pressure drop lost through any pipe line or station is wasteful to the efficient transport of gas. To realize the fullest return on the investment, it would be ideal if load conditions were such as to produce 100% demand factor. Our pipe line networks design would be greatly simplified; each pipe would be sized for the particular load to produce just the right amount of pressure drop so that pressure at the downstream end would be proper for its use. Such an idea, of course, is rarely possible, the design being based more practicably upon the maximum requirement of demand. Other variables which enter into the problem often are determining factors; one of these is the condition of inlet pressure. During periods of off-peak demand the inlet usually reaches its maximum and conversely during the peak demand the pressure is at its minimum. The basis of good design must accommodate the maximum demand with the minimum pressure. The obvious arrangement is to introduce some type of pressure regulating device that would adjust itself to varying demands and to variable inlet pressures.

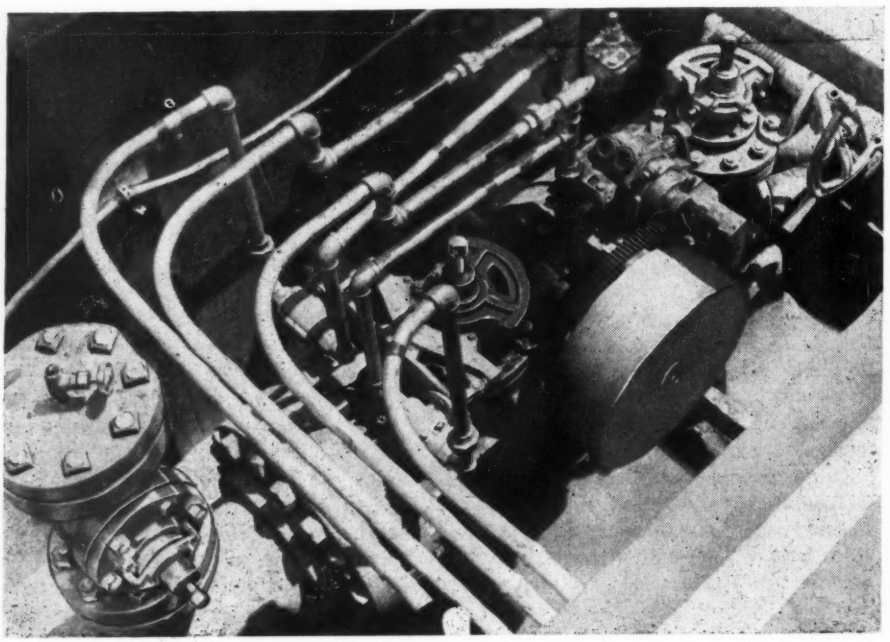


Fig. 1. Details of special Nordstrom valve control used by Pacific Gas and Electric Co. at Rio Vista Junction, Calif.

Conventional regulators usually are of the poppet-valve type and these perform rather well as long as there is ample inlet pressure available, or as long as they are sized sufficiently large to handle the normal flow requirements. When this usual condition of demand occurs which we are considering, these standard units introduce pressure drops which become very high, comparable in general with those which occur in a globe-type valve.

The metals in regulator bodies and their accompanying diaphragm chambers become highly stressed when operating at high pressure and, therefore, must be very heavily built. Sometimes in the larger sizes they present very formidable foundation problems, because of their weight. The more recent practice of using a control diaphragm chamber which is separated from the main regulator body removes the hazard of the high-pressure communicating to the diaphragm or its housing. By utilizing pressure controlling instruments it is possible to handle conditions of 800 lbs. inlet with only 15 lbs. in diaphragm chambers.

Recording Type Controller

Instrument-type control gradually is becoming standard practice on inlet pressures exceeding 125 lbs. and we have many installations of this type. Following our usual arrangement of having a recording pressure gauge to give a picture of the regulator performance, it was quite natural that we use a recording-type pressure controller.

So much for control. But the original problem of reducing pressure drop is still with us. It has been shown that conventional regulators are out for this requirement. A specific job of regula-

This article first appeared in "The Flow Line." Illustrations courtesy that publication.

tion, with certain contingencies already established, and its final solution will be used to illustrate how the problem can be handled.

Transmission Line Control

Originating in the Rio Vista gas field in California is a 12-in. transmission line which serves as a feeder for the northern San Francisco Bay area. A short distance from the boundary of this field is a 10-in. tap line which is one source of gas for Sacramento Valley territory.

When first put into operation both lines were receiving the same pressure; that is, they were getting approximately 600-lb. gas from the field. As load demand increased it became necessary to raise the transmission line pressure until now its upper limit is 800 lbs. With this higher pressure many new problems were introduced, one of which was the matter of regulators freezing due to high differentials. The expansion of natural gas from 800 lbs. to 500 lbs., which is the upper limit of the line pressure in the last section of the line to Sacramento, caused a reduction of temperature such that hydrates were formed. Several occasions of complete line stoppage made this problem rather serious. Therefore, one of the requirements for the device was to control 800 lbs. to 600 lbs. or less. The other important specification was that it offer the absolute minimum of resistance to flow during peak demand. To meet these conditions is beyond the scope of any ordinary conventional regulator.

Nordstrom Used for Control

Attention was focused upon the idea of the possibility of converting the existing Nordstrom line valve into a pressure control device. Having successfully used for many years valves for remote control over long distances as well as for station operation of throttling, we felt that the problem resolved itself into the development of equipment that would position the valve automatically in reference to pressure. Valves which were used for control work were located generally where electrical power was available, but unfortunately this particular unit was situated in a pit that was many miles from the nearest electrical energy. However, the power that was available from our 800-lb. gas line gave a force which if properly used would give sufficient energy to position the valve.

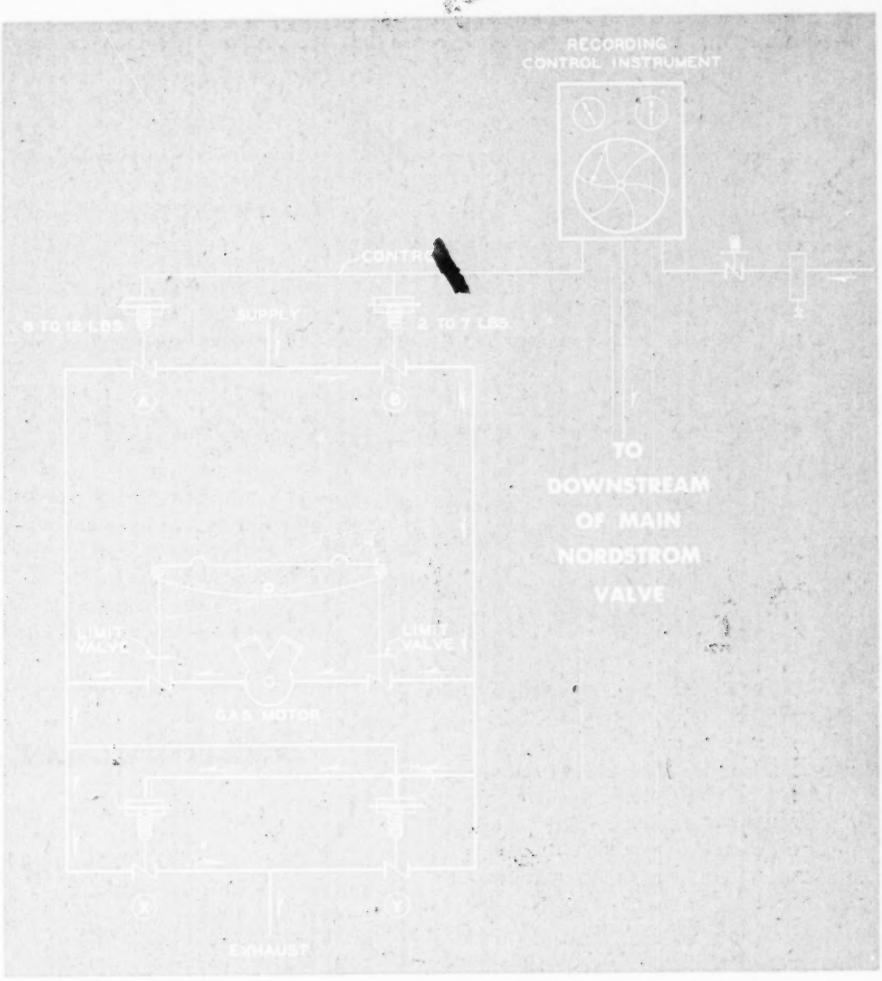


Fig. 2. How the gas motor direction of rotation is accomplished.

Inasmuch as a great deal of this augmented load was brought about by unnatural growth due to war demands, there had been no provisions originally made for any additional equipment.

Having some air drills of the reversible type on hand, we decided to apply one of these units through suitable gearing to the main valve. Consequently, the handwheel was removed and replaced by a large diameter spur gear and handles were attached to the spokes of this gear to permit hand positioning. The air motor was of the piston type; all internal mechanism which ordinarily controlled the direction of its rotation was removed and the ports plugged. This left only two openings for the gas; if pressure was admitted to one tap the motor would turn in one direction. The other pipe would serve merely for the exhaust. By simply transferring the supply and making what was previously the exhaust into the inlet and making original inlet an exhaust, reversing of rotation could be accomplished. To minimize the problem of gas supply reduction for this unit it was taken from the downstream side of the main valve. By regulating the amount of pressuring to the motor unit the speed of rotation could be controlled, a very useful feature when adjusting to the desired speed of response.

Fig. 1 is a photograph of this particular installation. The normal flow of gas is from right to left. The original line valve is shown in the upper right; below that to the left is the controlled valve. It was moved to this location from a position which was farther upstream. This was done to secure the longest possible distance between the point of reduction and the regulating station closer to Sacramento. The gas-powered motor can be seen with its pinion which drives the large spur gear. The circular housing on the gear is a safety guard to prevent any injury if someone happened to be in the pit during automatic operation. Downstream to the left can be seen two small units which appear as regulators. Actually these devices were made from the lower bodies of two ¾-in. regulators. These serve as limit cut-off valves which act to shut off the gas supply to

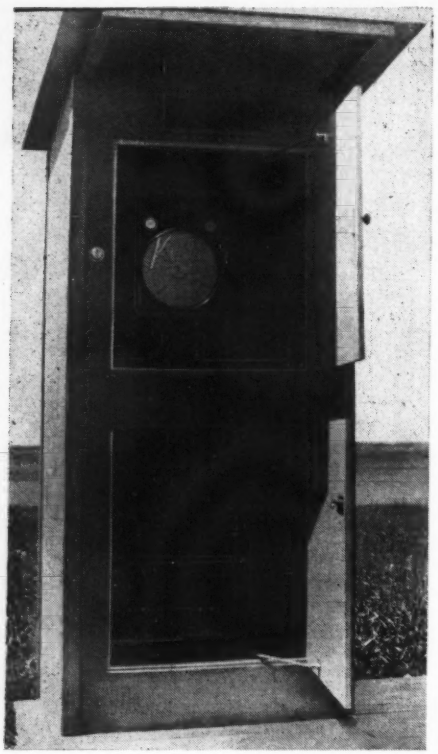


Fig. 3. Installation of instrument and valve.

the motor when either limit of "wide open" or "fully closed" is reached in the main valve. Because the plug of the controlled Nordstrom valve requires only a 90-deg. movement from the opened to the closed position, the cut-off valve stem is actuated by the worm-gear quadrant when it reaches the limit of its position. Each valve stem is connected to a common rocker arm so designed that when one limit valve is fully closed the other is wide open. This accomplishes an interlock which prevents any attempt of the mechanism to become stalled by trying to turn both directions at once.

Piping Arrangement

There are four pipes which lead to the gas motor, two alternately serving as supply and exhaust and two serving alternately as exhaust and supply lines. All other control equipment is mounted in a housing above ground.

To understand the control arrangement, refer to *Fig. 2*, which shows schematically how the gas motor direction of rotation is achieved. The supply for the motor as mentioned is taken from the downstream of the main valve; 40 to 60 lbs. is usual range.

The recording pressure controller is of the direct-acting type which means that when the static (downstream) pressure drops, the control pressure will drop. The instrument operates on natural gas which is supplied to it by the usual small regulator, the filter set-up feeding at about 17 lbs.

The diaphragms of valves A and B are connected together commonly to the instrument by the control piping. Valve A is a spring-closed type, which is adjusted to start to open at 8 lbs. and to be opened fully at 12 lbs. Valve B is a spring-opened type which starts to close at 2 lbs. and is fully closed at 7 lbs. With Valve A set at 8 to 12 lbs. and Valve B at 2 to 7 lbs., between 7 and 8 lbs. from the controller there is a dead spot when neither unit is open and hence no gas is flowing to the motor. It is this null point which makes the whole idea feasible.

The diagram shows the limit cut-off valves previously described. Their function is quite obvious. Valves X and Y are exhaust controls. Each diaphragm is connected to an opposing supply line, the spring adjustments are set such that they are normally closed with any pressure on the heads of less than two lbs. This means that with more than two lbs. they are wide open. The exhaust from these valves discharges to the atmosphere.

A typical cycle of operation is as follows: Assume the downstream line pressure is dropping, the instrument control pressure will drop, causing Valve B to open. Gas will flow through it, pass the limit valve (if it is open) to the gas motor. This supply gas will also flow to the top diaphragm of Valve X causing it to open. The gas will cause the motor to rotate to open the main valve. Exhaust gas will pass from the motor through Valve X and to the air. The drive will be in motion until such time as the downstream pressure is raised to the point of setting the controller, and finally the control pressure from the instrument will return to its original value.

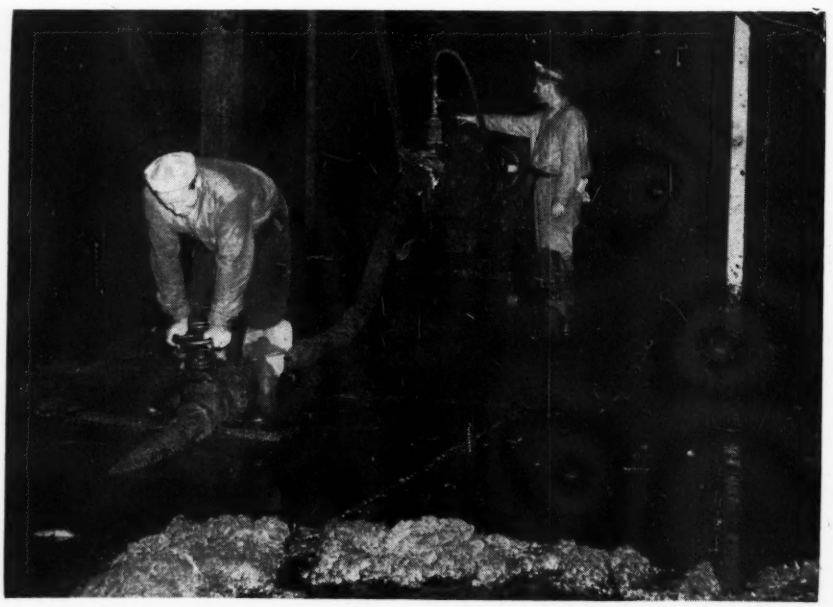
In the case of the downstream pressure rising, the controller and all the valves will act similarly. *Fig. 3* is a photograph of an actual installation of instrument and valve.

Sand Sucker Removes Sludge

A 20-hp. power dredging pump known as a sand sucker was used this year by The Brooklyn Union Gas Co., Brooklyn, N. Y., to remove the sludge in the gas holder at Wythe Ave. Station, Wythe Ave. and North 12th St. During the course of years a mixture of emulsion and mud had accumulated on the floor of the tank. This required removal when the periodic dewatering was made for inspection of the holder interior.

A major advantage of the sand sucker is its ability to handle the emulsion, mud and water separately, permitting separate and more efficient disposal of the material. Five hundred tons were removed this year in three weeks, with nine men working on the job.

The pump was used by The Brooklyn Union Gas Co. for the first time last year at the Belmont Ave. holder, Belmont and Williams Ave. At that time its use saved the company $9000 and this year the estimated saving was $8000. Photo shows Frank P. Loughlin, at valve, and George W. Brandenberg.



Tennessee Gas Builds $30 Million Additions to 1265-Mile Pipe Line

For a graphic view of the new installations, see the map on next page.

THE Tennessee Gas and Transmission Co. of Houston, Texas, has begun construction of additions to its natural gas pipe line at an estimated cost of $30 million. When the construction is completed, Tennessee will have increased its capacity by approximately 40%, to a total capacity of 381 MMcf daily.

Three-fourths of the increased capacity will carry flare gas now being wasted, which means that Tennessee will be purchasing in excess of 100 MMcf of flare gas.

In order to create the new capacity, Tennessee has received FPC permission to add 20,000 hp. to existing compressor stations and to lay 400 miles of 26-in. main line loop and 10 miles of 24-in. loop. Three new compressor stations are in process of construction—at Victoria, Texas; Cleveland, Texas; and Natchitoches, La. The FPC also granted Tennessee permission to purchase four existing compressor stations from the R.F.C. which were completed early this year.

Included in the project is a 95-mile extension of its line from Agua Dulce to the San Salvador field in the Rio Grande Valley, an area which previously has had little market for its large gas reserves. The 16-in. extension will have a capacity of 96 MMcf daily.

The increased output of the system will be felt as each new unit is put on the line. The project is scheduled to be completed in 1947.

TGT MOVES A COMPRESSOR

Fig. 1. Tennessee Gas and Transmission is a natural gas pipe line running from South Texas to West Virginia, 1265 miles. Fourteen compressor stations are necessary along the line to keep the gas moving, and many of them are in remote locations far from a railroad. This makes the job of transporting the big compressor engines, which weigh 50 tons, a difficult one. This photo sequence taken in Kentucky shows how one of the big engines was transported by truck to the station at Winchester from Mt. Sterling, 21 miles over winding mountain road. Fig. 1 shows how the engine fills freight car on siding at Mt. Sterling.

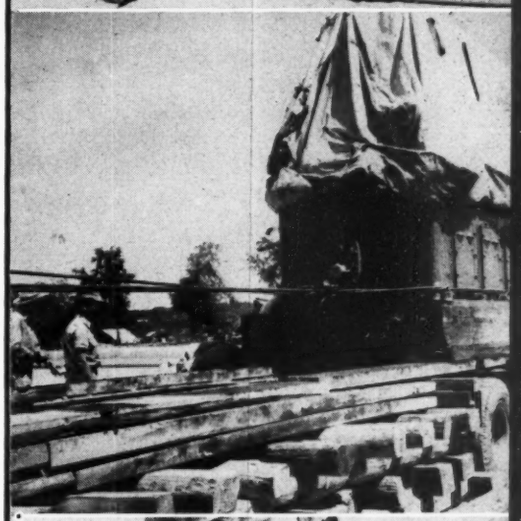
Fig. 2. Abe White, driving the giant White tractor with 50-ton trailer, stands on the ground beside the cab to illustrate its height. The engine was skidded off the freight car onto the trailer.

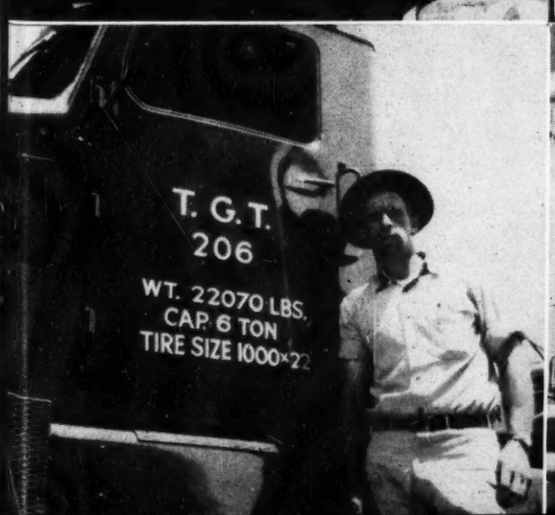
Fig. 3. The big trailer is carefully backed up to a temporary base of heavy hardwood cross ties on the station site. The engine base was not ready to receive the engine.

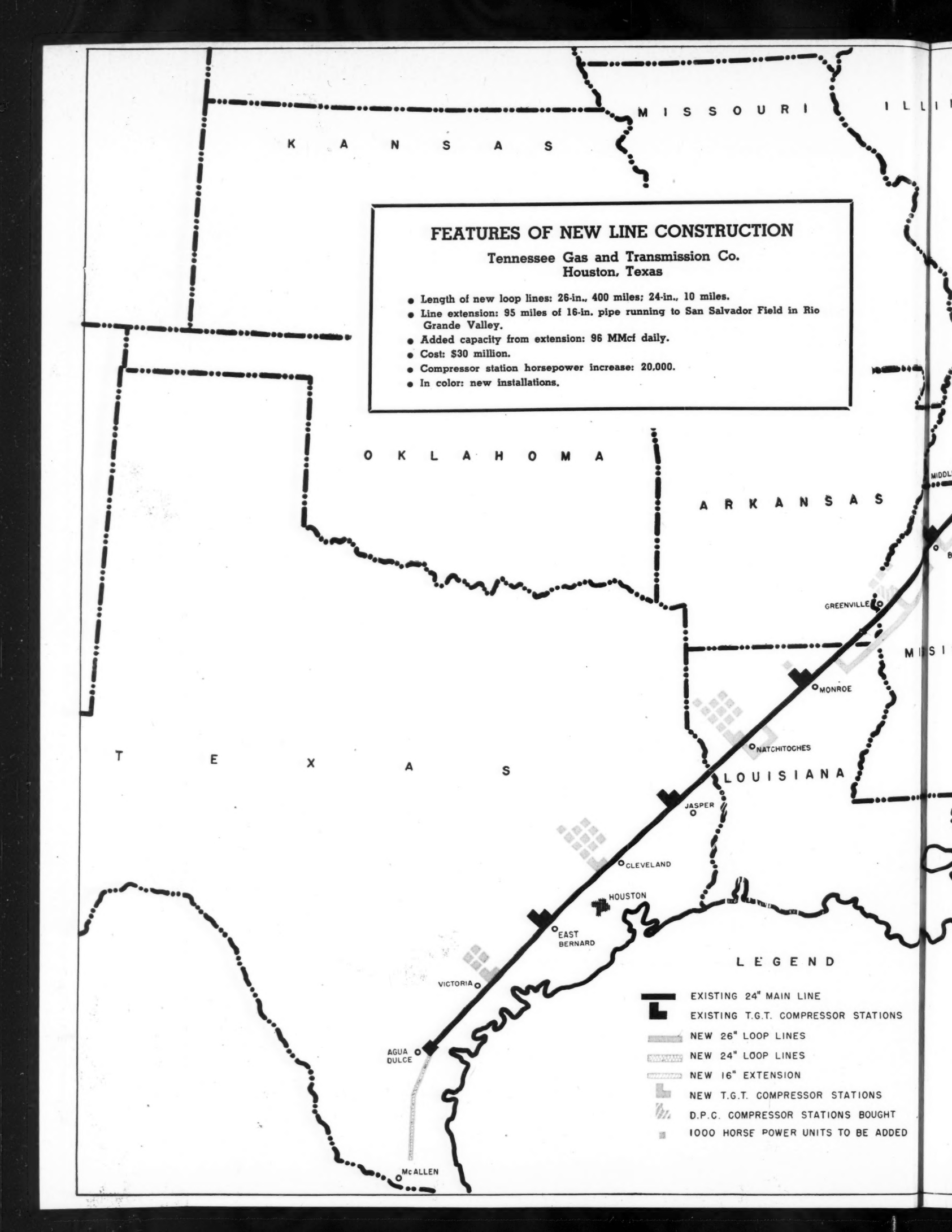
Fig. 4. A smaller truck with a winch is backed up to the other end of the base of timbers.

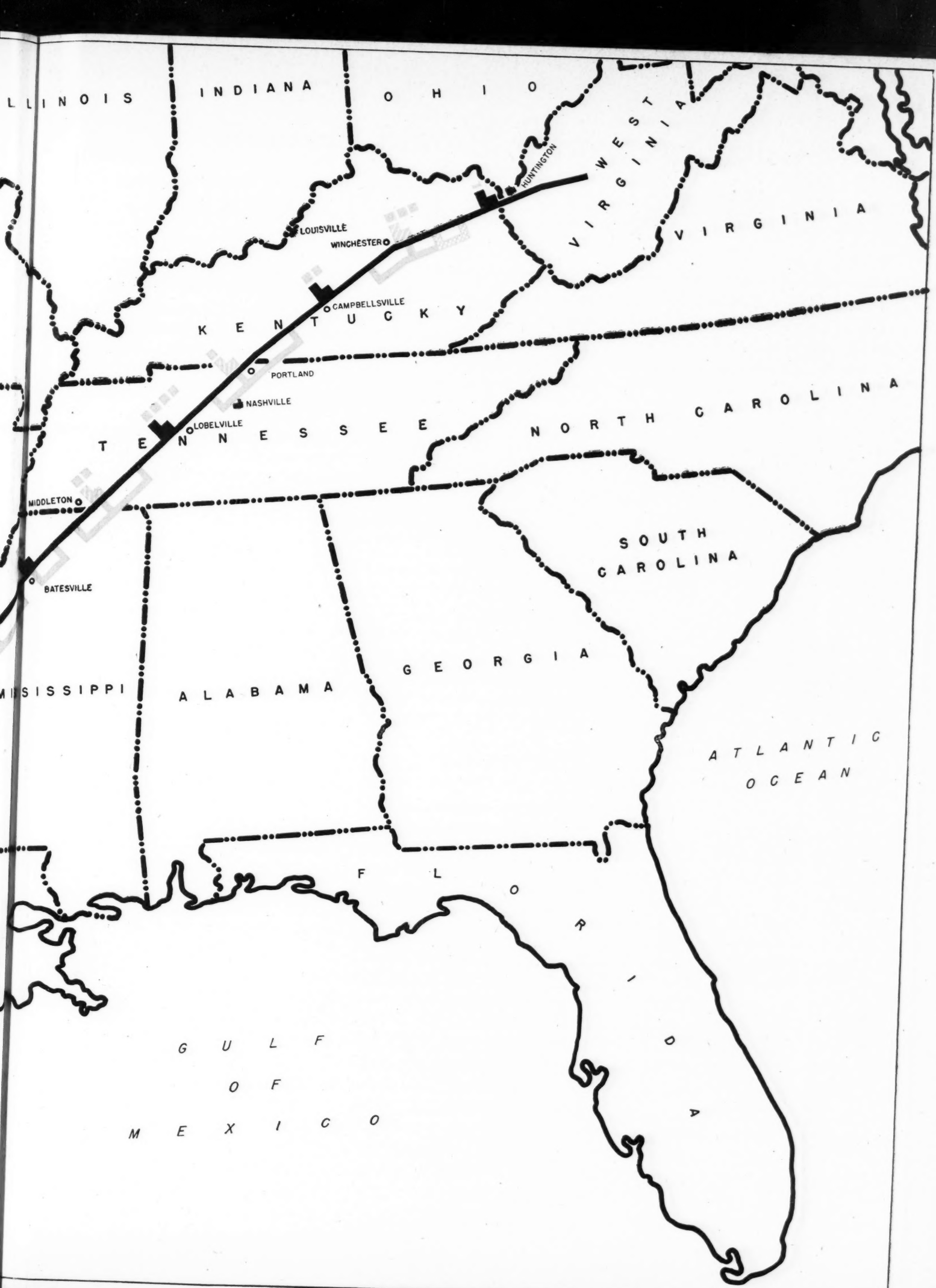
Fig. 5. Workmen tie the second truck's steel cable around engine and fasten it. Fig. 6. The critical moment. The cable tightens and the block slowly inches off the trailer onto the temporary base. The thick boards on top of the base were coated with graphite to enable the heavy engine to slip easily.

Fig. 7. A hard job well done. The powerful engine sits on its temporary base ready to take its place on the line when the permanent base is ready.






MISSOURI
KANSAS
OKLAHOMA
ARKANSAS
TEXAS
LOUISIANA
GREENVILLE
MONROE
NATCHITOCHES
JASPER
CLEVELAND
HOUSTON
EAST BERNARD
VICTORIA
AGUA DULCE
McALLEN
FEATURES OF NEW LINE CONSTRUCTION
Tennessee Gas and Transmission Co.
Houston, Texas
• Length of new loop lines: 26-in., 400 miles; 24-in., 10 miles.
• Line extension: 95 miles of 16-in. pipe running to San Salvador Field in Rio Grande Valley.
• Added capacity from extension: 96 MMcf daily.
• Cost: $30 million.
• Compressor station horsepower increase: 20,000.
• In color: new installations.
LEGEND
EXISTING 24" MAIN LINE
EXISTING T.G.T. COMPRESSOR STATIONS
NEW 26" LOOP LINES
NEW 24" LOOP LINES
NEW 16" EXTENSION
NEW T.G.T. COMPRESSOR STATIONS
D.P.C. COMPRESSOR STATIONS BOUGHT
1000 HORSE POWER UNITS TO BE ADDED


ILLINOIS
INDIANA
OHIO
WEST VIRGINIA
VIRGINIA
HUNTINGTON
LOUISVILLE
WINCHESTER
CAMPBELLSVILLE
KENTUCKY
PORTLAND
NASHVILLE
LOBELVILLE
TENNESSEE
NORTH CAROLINA
MIDDLETON
BATESVILLE
SOUTH CAROLINA
GEORGIA
MISSISSIPPI
ALABAMA
ATLANTIC OCEAN
FLORIDA
GULF OF MEXICO

Gas Companies Should Promote
ALL-YEAR AIR CONDITIONING

Air conditioning can be an ideal anchor to secure cooking, water heating, space heating loads. Five reasons why gas is best for air conditioning; seven reasons why gas companies AND combined utilities will find it to their advantage to exploit this field.

By LOUIS WOLLENBERGER

Industrial Gas Engineer
Coast Counties Gas and Electric Co.
Santa Cruz, Calif.

THE air conditioning industry expects to do $1.5 billion worth of new business in the next five years, in addition to an annual replacement market of $350 million. These figures are based on a survey by S. M. Ahmed of Hirsch & Co., members of the New York Stock Exchange. The data was collected from manufacturers, distributors, government agencies, and trade associations and publications.

Mr. Ahmed's report further shows that the number of residential installations increased 114%, commercial 118%, and industrial 143%, in the three prewar years of 1939 through 1941. These figures are for an industry just in its infancy; the saturation point is still in the distant future. Fewer than 1% of the homes valued at $12,000 or more, and having central heating plants, have air conditioning units; only 3% of department stores, 3% of doctors' and dentists' offices, 2% of bank establishments, 2% of drug stores, 4% of beauty and barber shops and 6% of restaurants have them. Many other markets have hardly been tapped. This indicates the potential market for air conditioning. The gas industry must prepare to get its share of this attractive business.

Factors favoring the growth of the air conditioning industry are:

1. **People are becoming increasingly air conditioning conscious. We are being educated in the comforts of air conditioning in railroads, bus travel, theaters, restaurants, stores and offices. It is a WANT with many who have enjoyed its benefits at some time or other.**
2. **Sale of equipment is self-expanding, one sale leading to another.**
3. **Better equipment is available, offering improved performance and operating more economically.**
4. **Many industrial and commercial processes require air conditioning to produce a uniform and better product.**

The above market statistics have been carefully analyzed by the electric industry and the manufacturers of electric appliances. They recognize in the electric air conditioner an anchor to secure and promote the use of electricity for cooking and water heating. Unless we in the gas industry can offer year-round air conditioning, our cooking, water heating, and our heating loads are in danger. This is no idle talk, as I will attempt to prove later.

The next consideration should be a study by the utility of the market area for such equipment. There are few climates where some type of air conditioning would not be welcomed. There are no territories on this coast which do not need air conditioning for certain commercial and industrial processes or applications.

Moisture Need is Criterion

Unfortunately, temperature alone is not sufficient data to determine where an air conditioner is needed. Moisture content of the air determines to a great extent the comforts of a human being. It is, therefore, necessary to know the temperatures and relative humidities existing in our territories before deciding the territorial boundaries of potential market areas for such equipment.

Very complete climatological data is contained in a report of the Air Conditioning Committee for year 1939-1940 by the Pacific Coast Electrical Association. This report is limited, however, to the State of California. It is possible that similar data is available for other states. A careful study of the climatic conditions and data contained in this report will determine quite clearly where summer air conditioning is necessary, and what type of equipment is required.

It is entirely possible in some areas to have effective cooling by means of evaporative or desert cooling. Where this can be done successfully, the gas company should recommend this type of cooling equipment in conjunction with gas-fired forced air heating in the more moderately priced homes where complete air conditioning might be considered too costly. Some commercial and industrial applications of air conditioning will be necessary in almost any territory regardless of climatic conditions. Internal heat loads and air requirements will govern such applications. The residential market in areas where air conditioning in summer is indicated as desirable, can generally be limited at the present time to new construction of homes costing $8500 or more, and to existing residences of the same class. These limitations are based on the present cost of all-year air conditioning equipment and also on the operating costs. There will, of course, be exceptions to this rule.

An Excellent Market

The homes and buildings now heated by central forced air heating systems provide an excellent market. Here the installation costs will be materially

A CRITICAL AND comprehensive summary of all-year air conditioning—summer cooling and winter heating—is presented in this paper, which was delivered at the Pacific Coast Gas Association meeting in September. The importance of this combined load to the gas industry is pointed up by the author, who concludes that "unless we in the gas industry can offer year-round air conditioning our cooking, water heating, and our heating loads are in danger." In discussing an all-electric package unit all-year air conditioner now on the market, Mr. Wollenberger calculates, with respect to its "reverse cycle refrigeration" heating performance, that "1000-Btu natural gas with a (gas-heating) appliance of 75% efficiency would need to sell for 62 cents per Mcf to compete with one-cent electric energy."

The author has been with Coast Counties Gas & Electric Co. since 1930. He has been associated with the gas industry since 1927, following a college career at Purdue and the University of Michigan.

reduced if the present duct system can be used. Most gas utilities have done a splendid job of selling gas-fired forced air heating and a ready list of prospective air conditioning applications should be available.

During the period of non-production occasioned by the late war, the manufacturers of gas air conditioning equipment have been busy in the redesigning and improvement of their equipment. Field tests on such equipment have revealed some inherent weaknesses in design, which are to be expected in the development of any new equipment. Service problems with this equipment have dictated the need for any changes in design. I am happy to report that manufacturers have solicited our help and criticism to the extent that new models are now available. The basic weaknesses apparent in the pre-war design of certain equipment have been, I believe, entirely corrected by redesigning and, in some cases, by changing the manufacturing processes.

Problems Reduced

From what I have been privileged to see in the plant of one manufacturer, I am ready to predict that costly replacements and abnormal servicing problems should be reduced to a normal rate. It is hoped with the new models a liberal replacement agreement will be offered by the manufacturers, through the gas companies, to the owners of obsolete equipment. The gas industry will then be ready to explore the tremendous market for such equipment and its resultant load.

The gas industry has never been offered a more desirable load than summer air conditioning produces. This load would complement the heating load with which we have been quite successful. To serve the summer air conditioning load would require *no* additional capital investment in production, transmission, distribution, services, meters or regulators. To add this business to existing gas accounts would require no additional commercial expenses. Additional production and distribution facilities will be required to serve the estimated 5 million new homes to be built in the next five years. However, these same facilities will also be capable of serving the air conditioning load in this new construction. These are the favorable factors about the gas load resulting from air conditioning.

Electric Men Retreat

Our electric competitors are looking upon this business somewhat differently. They have so promoted the air conditioning business that in some localities it has imposed a critical load on their lines in summer similar to the heating load on gas lines in winter. From data available it appears that the diversified annual load factor resulting from residential summer cooling is about 5%. On the other hand, a combination of winter heating and summer cooling, if accomplished by the heat pump, may have a diversified annual load factor as high as 25%. These conditions have prompted the electric industry in development work to perfect the reverse cycle refrigeration machine. Until recently no manufacturers of electric equipment have offered a complete package unit as an all-year air conditioner.

I have received literature and catalogs from one manufacturer in Los Angeles who offers a complete-package unit all-year air conditioner in 3-, 5-, 7½-, and 10-ton cooling sizes with corresponding heating capacities of 46,000, 77,000, 115,000, and 154,000 Btu. It is claimed the only utility required is electric connections. "No unsightly water tower or hazardous gas connections are necessary to provide complete year-round air conditioning." I have not been able to figure how this machine adds moisture to the air during winter heating for humidifying, without water connections.

Over 100% Efficiency

An electric refrigerator for heating or cooling houses would not differ in essential principles from the ordinary electric refrigerator used for cooling foods. Both are essentially heat pumps, and the house cooler is only an expanded form of domestic refrigerator. Since the heat delivered by the condenser of a refrigerator heat pump is always greater than the heat equivalent of the electric power input by an amount equal to the heat flow into the evaporator, the efficiency is always in excess of 100% on the heating cycle.

Depending upon the outdoor temperature, the machine to which I refer will deliver almost 4 heat units to 1 in input with outdoor temperatures of 60°, and at 30° outdoor temperatures will deliver 3½ heat units for each unit of energy input. Using nature's energy has definite appeal; and, furthermore, reducing costs of electric heating of homes to about 1/3 by such use actually makes electric heating quite attractive to many. As an example, the 5-ton unit, with a 30° outdoor temperature, will deliver 58,000 Btu per hour with an input of only 4.8 kw. This figures roughly 3½ Btu for each Btu input. One thousand Btu natural gas, with an appliance of 75% efficiency, would need to sell for 62 cents per Mcf to compete with 1-cent electric energy in the above example. We frequently compete with electric energy at less than 1 cent per kwh. That we have a fight on our hands to hold our heating load in the future is becoming apparent; if we lose this we also lose the cooking and water heating loads. To win this fight, we must also offer year-round air conditioning.

Ratios In Better Balance

The gas industry has available several types of all-year air conditioinng equipment today. I hope we will have more. The ratio of heating capacity to cooling capacity in gas equipment is in better balance. A home requiring 5 tons of refrigeration for cooling will almost surely require more than 58,000 Btu per hour for heating. The heating capacity of the equipment will not decrease as the outdoor temperature decreases — an inherent weakness in the reverse cycle electric unit. We can still talk operating cost and the other major advantages of absorption refrigeration over the mechanical heat pump type.

The first cost of gas equipment compares very favorably with the first cost of comparable sized electric equipment. With units having the same cooling capacity, I believe the present gas equipment may be more compact and require less space than the electric unit, excluding our water tower. As an example, the 5-ton electric unit is 82 in. long by 47 in. wide and stands 74 in. high. A comparable gas unit is 57½ in. long by 35 in. wide and stands 84 in. high. The electric unit weighs 3170 lbs. compared to 2300 for the gas unit. Size and weight are in favor of the gas all-year air conditioner.

Usage Varies

From all available records, gas usage on a year-round air conditioner will vary considerably. This is true more so on the cooling cycle than on the heating cycle. In analyzing past records of installations, it is found that in the most severe climates such as we have in the Imperial valley in California, a machine will use as high as 4 Mcf for cooling for each Mcf for heating during the year. In climates such as experienced in Northern California, records indicate this ratio to be closer to 1 to 1. The length of the winter season together with the intensity of cold affect these ratios as severely as do the intensity of heat and length of summer. It has been found that a true relation exists between the cooling requirements of a home and the heating requirements. On page 20 of the A.G.A. report "Gas Summer Air Conditioning," this relation is shown in a curve

using degree day heating requirements. Briefly, in climates having 1000-degree days heating requirements, the ratio of annual cooling Mcf to annual heating Mcf would be 3 to 1; for 2000-degree day climates the ratio is 1.4 to 1; for 3000-degree day climates, the ratio is 1 to 1.25; for 4000-degree day climates, the ratio is 1 to 2.2; and in climates of 5000-degree day heating requirements, the ratio of annual cooling Mcf to annual heating Mcf would be 1 to 4 Mcf. From these relations, we should be able to predict with a fair degree of accuracy the annual gas load resulting from year-round air conditioning equipment. These consumption figures present a very enticing picture to the gas industry.

For the combination gas and electric company, the gas air conditioner is even more attractive. In addition to the off-peak summer gas load, the utility will benefit from an increased load factor in electric consumption. The average electric usage is in direct ratio to the gas consumption, and will average about 20 kwh per Mcf used, if a water tower is employed. With non-recirculating water, this average will drop to about 9 kwh per Mcf used for cooling. The electric revenue resulting from a gas-operated air conditioner, if an ordinary block rate were applied, would be about one-third the revenue of an all-electric machine. This revenue would result without a high kw demand and show a better return per kwh to the utility than the higher consumption requiring heavier construction to serve. The combined gas and electric gross revenue will be about two-thirds the amount of an all electric unit; however, the combined net revenues resulting from a gas unit should be greater.

Present Facilities Adequate

In view of the above, it would appear the gas utilities—both straight gas and the combination gas and electric companies—should promote the use of gas-operated all-year air conditioners. In all probability, the utility will find its present distribution facilities, both gas and electric, capable of serving this type of equipment. I doubt that this would be true if all electric equipment were promoted to any extent.

It is desirable that the gas utility actually control the promotion of all-year air conditioning during this pioneering stage. The utility must accept this responsibility with the manufacturer to assure proper engineering application and good service. We cannot afford to have this type of equipment ruthlessly sold and promoted by the selfish interests of fly-by-night dealer organizations. The experience of the electric air conditioning equipment dealers clearly demonstrates the need for a well organized program for specialized personnel to handle this type of equipment sale. Many unsatisfactory air conditioning installations have been made which have retarded the growth of the entire industry. We should strive to avoid these mistakes.

A specialized air conditioning sales force should be supported by an application or engineering department where each job is thoroughly engineered before being sold. There should be no place for chiselling or cutting of corners by the salesman in order to consummate a sale. Each job must have been planned and a complete set of specifications prepared to cover the installations.

The manufacturer of such equipment must also accept a great deal of responsibility in this promotional program. He must provide the training schools for salesmen, for the application engineers and for the service personnel. The manufacturer must cooperate with the utility in formulating a liberal replacement policy on defective parts and obsolete machines. The utility should also choose equipment manufactured by one who has helped the gas industry. Too often we find a manufacturer who has no loyalty and is motivated to manufacture a certain appliance for a selfish interest only. We are all in business to make money but let's play ball with one who also depends on the industry's survival.

In summarizing, I believe the customer is best served by using gas-operated all-year air conditioning equipment because:

1. **Operating costs favor gas equipment.**
2. **First costs are favorable.**
3. **Service and maintenance costs favor gas equipment.**
4. **Only gas equipment is available as all-year air conditioning with adequate heating capacity to match cooling capacity.**
5. **All-year gas air conditioning equipment is more compact than comparable electric equipment.**

The gas utility and the combination gas and electric utility should promote gas all-year air conditioners because:

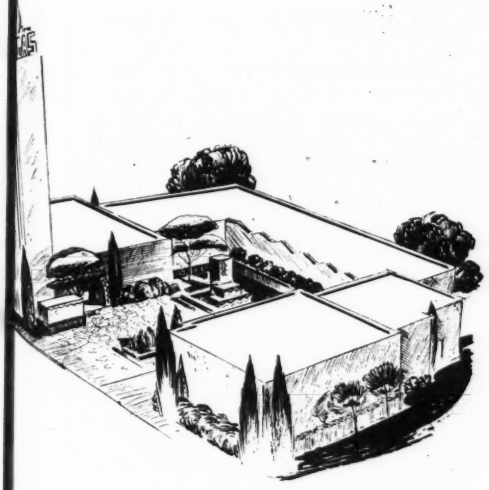
1. **The additional gas load can be procured with no additional capital investment in facilities.**
2. **Assuming we already serve gas for heating or other uses, NO additional commercial expense is involved in this load.**
3. **By selling all-year gas air conditioning, the gas utility will secure its cooking, water heating and heating loads.**
4. **Gas air conditioning promotes the modernity of gas fuel.**
5. **Gas all-year air conditioners will produce a very desirable electric load, having a high load factor in the case of the combination gas and electric utility.**
6. **The resulting electric load can also be served in most cases by existing facilities and, therefore, with no additional capital investment.**
7. **The combined net revenues resulting from the sale of gas or gas and electricity should equal or possibly exceed the net revenue from electric conditioners.**

Gas Steals Show at Oregon Exhibit

Occupying 2000 of the auditorium's 18,000 sq. ft. of floor space, spread-eagling one entire end of the hall, the display of the Gas Appliance Society of Oregon outshone all others at the three-day Home Appliance Show held at the Civic Auditorium in Portland, Sept. 20-22. Nearly 100,000 visitors viewed the extensive exhibit arranged by the First National Bank of Portland as a stimulus to "more practical" allocation of the buying public's funds. Displays included an arrangement of seven ranges, including Magic Chef, Caloric, Tappan, Wedgewood, O'Keefe & Merritt, Roper, and Universal; the last-named served as a live demonstration of the cooking superiority of gas.

THE BLUE FLAME

Shines at the State Fair in Texas



THE Blue Flame, personalized by a 10-ft. neon "blaze" set atop a 70-ft. tower at the Lone Star Gas Co. exhibits building, was a star performer at the Texas State Fair, held Oct. 5-20 in Dallas. Of a million Texans who saw the show, many stopped to view the gas appliance wonders in Lone Star's building.

Fourteen display rooms, filled with what aggregated the greatest collection of gas equipment in the history of the annual fair, housed the exhibit.

Vying with the now-familiar New Freedom Gas Kitchen displays for public interest was what Lone Star described as the "most magic of all the new gas wonders"—the all-year gas air conditioner, which by the flip of a switch selected heating, cooling, or independent air circulation. Five 5-ton units were in operation throughout the fair to provide comfortable temperatures for visitors. The units, which had an effect similar to the melting of 50,000 lbs. of ice every 24 hours, doubled as show attractions and operating devices to keep the customers comfortable.

CP Display

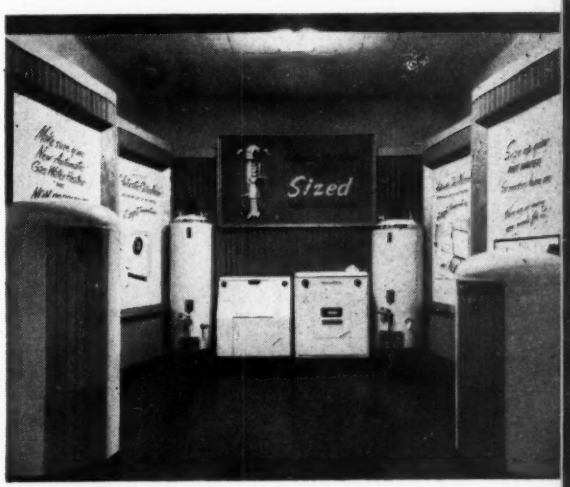
Others of the 14 display rooms presented CP ranges, the 1947 Servel gas refrigerator, vented heating equipment, floor furnaces, circulating heaters, radiators, and hot water heaters. The new Servel was shown in a simulated gift box, partially "torn open," with a huge card attached. "To The American Housewife."

The CP range display showcased three ranges—Universal, Garland, and Chambers—which formed a triangle. From the center of the triangle rose a pyramid topped by a blue gas flame. Signs directed attention to the 22 CP features built into each stove.

To industrial and heavy duty equipment for restaurants and large institutions was allocated one large room in the exhibit.

Servel held a large corner on spectator interest, with an exhibit of four refrigerators in addition to the "gift package" display, and four complete New Freedom Gas Kitchens. The "Garden-Hobby" kitchen was featured, with all gas appliances connected and in operation. Lone Star cookery experts were on hand to demonstrate the advantages of gas in this New Freedom model.

Stargas, the company's butane product, was also given a spot in the show. Enlarged photographs depicted the production of butane from the refinery to the burner.



TOP TO BOTTOM:

Advantages of closet type furnace are extolled in this Lone Star cubicle. Completely automatic is the theme.

The "Garden-Hobby" kitchen, in which gas appliances in operation were demonstrated, was one of four Servel kitchens displayed.

Importance of sizing is underlined in water heater display, which ties in clothes washers and dishwashers.

Industrial and heavy-duty equipment was given large play, as is shown in photo at lower right.

Below, the all-year air conditioner, which was in operation throughout the showing to keep the building comfortable.

Gas Displays Planned for Hotel and Metals Expositions This Month

Planning for industrial gas exhibit at National Metals Congress are, from left, seated, L. R. Foote, Bryant Heater; C. E. Cunningham, Selas; L. J. Strohmeyer, Eclipse Fuel Engineering; C. F. Petersen, Mid-Continent Metal Products. Standing, H. A. Sutton, former A.G.A. Industrial and Commercial Section head, and M. A. Combs, A.G.A.

FRESH from starring roles at the A.G.A. convention in Atlantic City last month, new model industrial and commercial gas equipment will be paraded before two expositions this month.

Commercial gas cooking equipment will be the first to take the stage, appearing in the combined commercial gas cooking exhibit sponsored by the A.G.A. and leading manufacturers at the 31st National Hotel Exposition, New York, Nov. 11-14.

Nine exhibitors have contracted for the entire north wall of the display hall— American Stove Co., G. S. Blodgett Co., Inc., The Cleveland Range Co., Detroit-Michigan Stove Co., Ershler & Kruken, Inc., J. C. Pitman & Sons, Inc., Savory Equipment, Inc., and Standard Gas Equipment Corp.

The industrial exhibit will also be an A.G.A.-arranged combined display, this time at the National Metal Congress and Exposition, Atlantic City Public Auditorium, Nov. 18 to 22. Joining forces to present the largest single exhibit at the congress are American Furnace Co., Bryant Heater Co., Burdett Mfg. Co., Carbomatic Corp., Eclipse Fuel Engineering Co., The Gas Machinery Co., Gehnrich & Gehnrich, Inc., Charles A. Hones, Inc., Intercontinental Engineers, Inc., The C. M. Kemp Mfg. Co., Mid-Continental Metal Products, Selas Corp. of America, and Surface Combustion Corp.

CALENDAR

November

National Hotel Exposition—Grand Central Palace, New York City, Nov. 11-15.

National Metal Congress and Exposition—Atlantic City, Nov. 18-22.

Mid-Southeastern Gas Association—Raleigh, N.C., Nov. 21-22.

Independent Natural Gas Association—Ft. Worth, Texas, Nov. 22.

New Jersey Utilities Association—Seaview Country Club, Absecon, N.J., Nov. 22-23.

December

American Society of Mechanical Engineers—New York, Dec. 2-6.

National Exposition of Power and Mechanical Engineering, Grand Central Palace, N. Y., Dec. 2-6.

January, 1947

Midwest Industrial Gas Council—Stevens Hotel, Chicago, Jan. 24.

March

New England Gas Association—Boston, March 20-21.

April

American Gas Association—Edison Electric Institute Accounting Conference—Hotel Statler, Buffalo, N.Y., April 7-9.

National Association of Corrosion Engineers Annual Convention—Palmer House, Chicago, April 7-10.

American Gas Association Distribution and Motor Vehicle Conference—Hotel Cleveland, Cleveland, Ohio, April 14-16.

Southern Gas Association—Biloxi, Miss., April 16-18.

American Gas Association Natural Gas Department Spring Meeting—Stevens Hotel, Chicago, April 30-May 2.

Use of A.G.A. Manual in Selling Told at Oklahoma Utilities Meet

MORE beautiful and efficient appliances, better service connections, and the application of new sales tools to meet the approaching era of keener competition from other fuels, were among the themes of papers and talks delivered bfore the one-day meeting of the Gas Division, Oklahoma Utilities Association, at the Biltmore Hotel, Oklahoma City, Sept. 20.

With a copy of the new "A.G.A. Reference Manual of Modern Gas Service" in his hands, M. H. North, director of advertising and sales promotion, Oklahoma Natural Gas Co., Tulsa, outlined plans of his utility to place this loose-leaf folder-type book in the hands of 150 key architects and builders in his company territory. These will be distributed personally by representatives of the sales department. The plan is to have the employee who hands out a manual follow through personally with the architect and builder and report progress on card records kept on file in company offices.

The manual, supplemented by personal contacts, will be relied on to assist builders in making proper installations in homes and other buildings, to expand the number of all-gas homes and to encourage use in the New Freedom Gas Kitchen of proper modern gas appliances. The booklets are available for all gas utility companies, Mr. North explained.

While the gas industry does not lend itself to the introduction and abandonment of new gadgets each year, it is making a record of steady progress in the design and manufacture of more beautiful, compact, and serviceable appliances and equipment, which will help gas to maintain its leadership as the superior fuel, Eugene D. Milener, coordinator of general research, American Gas Association, New York, told the group. As examples he cited the use of glass-lining in water heaters and other innovations for prolonging the life of these appliances, elimination of cast iron from gas ranges except in the oven burners, and progress being made in designing gas furnaces to be more compact and efficient to meet the tendency of builders to leave less space in homes for household appliances.

Deploring the use of inadequate piping facilities on the properties of

many customers, where the gas company had no control over the type of installations made, E. C. McAninch, district manager, Oklahoma Natural Gas Co., Ardmore, Okla., urged a campaign to secure adequate piping in the thousands of new homes which will be completed within the next few years. This can be promoted by educational efforts, through city ordinances and cooperation between plumbers, builders, and the gas utilities, he said. The talk spurred the Gas Division to create a standing committee of the association to make a special study and set up standards in sizes of piping for various classes of gas installations in homes and other buildings.

Carl Dean, house heating engineer, Oklahoma Natural Gas Co., Tulsa, explained progress of a special committee of which he is chairman in urging adoption of city ordinances and cooperation of builders in securing proper venting in homes for gas heating appliances.

Customers Relations

D. E. Frieden, manager, Zenith Gas System, Inc., Waynoka, Okla., explained how his company is securing better customer relations, principally through more efficient handling of complaints and service calls. What the service man thinks about his company is most important, he said. A customer can easily be antagonized by a careless remark of a service employee, the speaker declared.

Many larger corporations, in the exercise of justifiable and pardonable pride in their accomplishments, have made the mistake of putting out the "Mr. Big" idea until it has often raised a question in the public's mind as to whether the corporation is a neighbor or an ogre, Will C. Grant, advertising director of the Lone Star Gas Co., Dallas, said.

At the Oklahoma Utilities Assn. meeting, from left: C. B. Day, chairman, gas div.; A. F. Potter, Oklahoma Utilities Assn.; W. K. Walker, Oklahoma Corp. Comm.; C. L. Orr, INGAA Mid-Continent secy.; F. E. Lorince, Dickinson Fuel Co., and R. R. Suttle, mng. dir. Southern Gas Assn.

Confessing that some utilities have been partially to blame for putting out the idea of their "bigness," Mr. Grant suggested that instead they begin disseminating information on what corporations really are, their relatively small earnings in relation to capital investment, the taxes they pay, employment they furnish, and the important part they have played in building up the free enterprise system.

More than 1000 utilities in the United States are carrying out dealer cooperation programs, Don Warner, new business manager, The Gas Service Co., Wichita, Kan., told the meeting. He explained that in his territory his company voluntarily gave up the exclusive agencies for a number of well known appliances, and encouraged dealers to take up these agencies in order to secure a wider distribution of gas appliances and to increase good will between appliance dealers and the utility. He also outlined a program of expanding the eight home service departments of the company to 24.

Technical Topics Studied at 23rd Session of Mid-West Gas School

TECHNIQUES and problems in metering, production, utilization, and distribution were examined at the three-day Mid-West Gas School and Conference, held at Iowa State College, Ames, Oct. 28-30. Conducted jointly by the Mid-West Gas Association and the Engineering Extension Service of the college, the session was the 23rd in the school's history.

One of the stellar attractions at the GAMA exhibit at the A.G.A. convention was the Dresser display, with a 6-ft. gas flame streaming from a 14-ft. tower forming "The Torch of the Future." Hardwick's circular display may be seen at upper left.

Industry and academic leaders spoke at the general session. H. Carl Wolf, managing director of the American Gas Association, New York, reassured his hearers that "Gas Keeps Moving." Atomic power was discussed by Dr. Adolf Voigt, Manhattan Project chemist and assistant professor of chemistry at Iowa State.

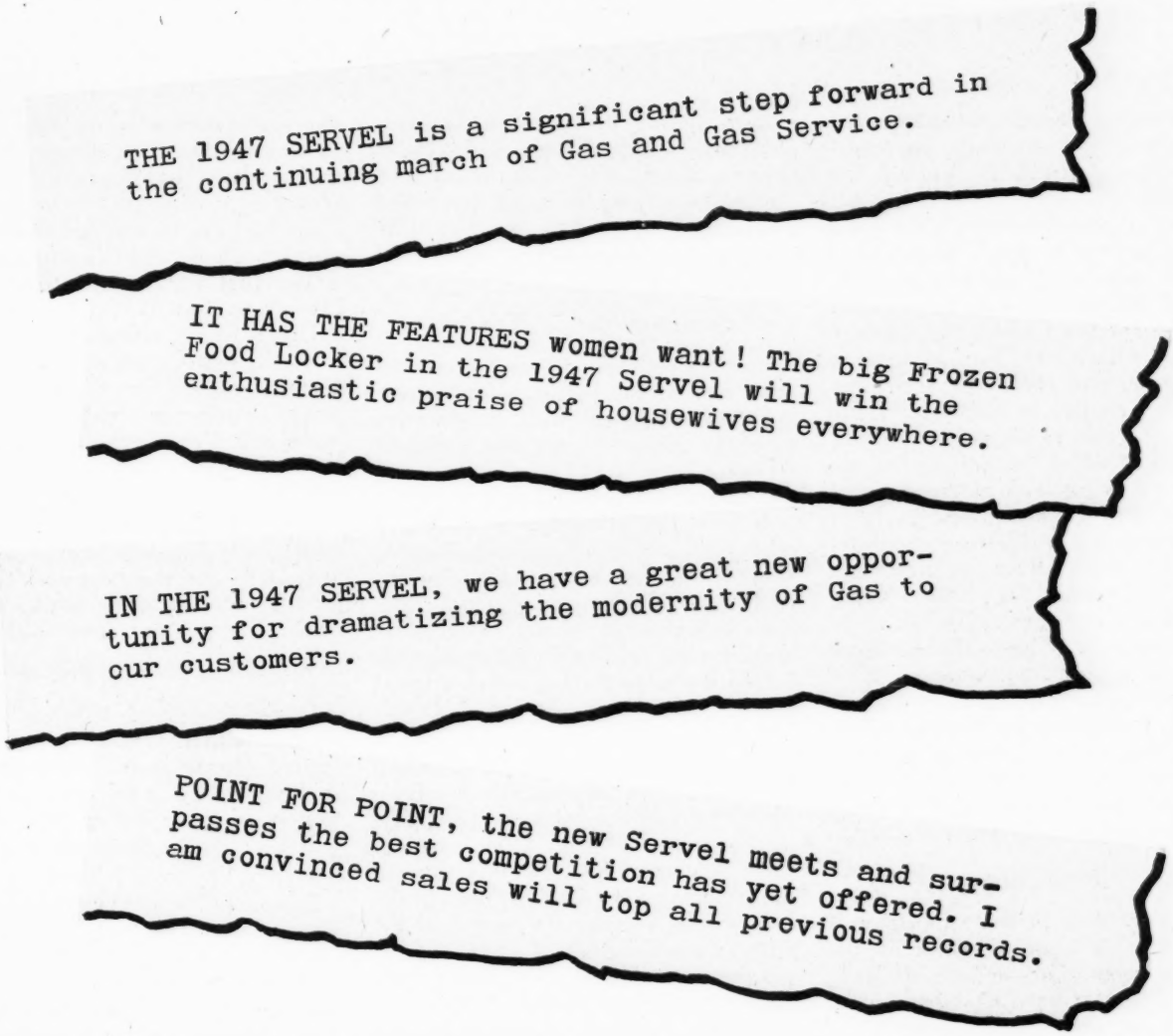
Meter men studied diaphragms, carbon valves, dry positive displacement gas meters, methods of field testing, meter shop practices, and orifice metering and maintenance under direction of manufacturer and utility engineers.

Leakage—its repair and location—and construction equipment, methods, and materials were the principal subjects considered at the sessions of the distribution section. To the utilization section were presented new developments and requirements on domestic appliances, among other subjects.

Great new 1947 Servel

a smash hit

AT A.G.A. CONVENTION


THE 1947 SERVEL is a significant step forward in the continuing march of Gas and Gas Service.
IT HAS THE FEATURES women want! The big Frozen Food Locker in the 1947 Servel will win the enthusiastic praise of housewives everywhere.
IN THE 1947 SERVEL, we have a great new opportunity for dramatizing the modernity of Gas to our customers.
POINT FOR POINT, the new Servel meets and surpasses the best competition has yet offered. I am convinced sales will top all previous records.

These statements are typical of the overwhelming enthusiasm that greeted the unveiling of the 1947 Servel Gas Refrigerator in Atlantic City. They are indicative of the future good will and record-breaking sales promised by the great new Servel for the year just ahead.

The 1947 Servel offers a new, big Frozen Food Locker, a specially designed flexible interior and many other sales-building features. These, combined with Servel's silence and dependability, will make it the outstanding choice of thousands of buyers.

Now is the time to plan for 1947. Line up an adequate, highly trained sales force. Decide on hard-hitting promotion and advertising materials. You'll then be in a position to take full advantage of the great new 1947 Servel Gas Refrigerator.

Servel, Inc. • EVANSVILLE 20, INDIANA

Company Publications Can Pay Dividends

By K. C. PRATT,
K. C. Pratt, Inc.,
New York, N.Y.

The employee magazine has important jobs to do in educating and entertaining. By fostering pride in the industry and the company, by promoting loyalty, it can materially aid in the betterment of industrial relations. And it will gain the recognition it deserves.

IN the earlier days of newspaperdom there were two standard ways editorial writers introduced a subject for discussion. One was: "We view with alarm . . ." and the other: "We point with pride . . ." to be followed by a diatribe against the mud puddle in front of the court house, or a paean of praise for the Ladies' Aid Society.

We who have been in the company publication field for a long time, and who have studied it objectively, can point with pride to the good work this journalistic effort is doing, but we should also view with alarm some of the poorer products we see.

We point with pride to the manner in which some of them are creating a common ground for better labor-management relations.

We point with pride to the way some of them present the news of their company and their industry to employees, consumers and stockholders.

We point with pride to the growing recognition being given to this field of endeavor by schools and colleges throughout the country.

New Ideas

We point with pride to the interest taken in this type of work by the younger generation—college students, returning veterans and others—who are looking for a place to serve industry, and who will bring new blood and fresh ideas into the business.

But we view with alarm the failure of some publications even to attempt to create a proper atmosphere for better understanding between labor and management.

We view with alarm the sloppy production jobs which some editors permit.

We view with alarm the indifference with which officials of some companies look upon this potent public relations tool.

Condensed from a paper presented at 28th annual convention, American Gas Association, Atlantic City, N.J., Oct. 7-11.

In reviewing the field of company publications, I find a lot of things of interest. Some of them are good . . . excellent in fact. Some of them, I'm afraid, are bad from the standpoint of our future as editor-executives of our respective companies.

Common Sense Needed

Fortunately there is nothing on the debit side of the ledger which cannot be corrected — and with comparative ease, I think — if we do sufficient thinking about it and then apply good, common-sense remedial action.

In the gas industry, as in every other industry, good public relations (and I use the term public relations as being inclusive of industrial relations) begins at home. Maybe we should start with the editor himself before we attempt to develop a good public relations program for employees.

In my opinion, most editors fail to capitalize upon the countless opportunities which they create for dramatizing to management the excellent work they are doing. And thus, human nature being what it is, nobody in the company recognizes the merits of the editor's work to its full extent. So, let me recommend, first of all, that editors with already established publications do some thinking about ways and means of building confidence within their respective managements in the job the publication is now doing—and what is more important, the job it can do when it is used to full advantage.

"Sell" Compromise

Let me outline quickly the ideological plan behind the company publication. It is not complete in detail, but it should serve as the basic framework on which to hang the details, both common and peculiar to each particular product.

And let me say, parenthetically, that I'm not a union-buster. I'm for them. They have done a lot of good. But the way our system is set up there has to be a certain amount of give and take among all of us. Compromise is the life and breath of the democratic body. I've got to tell this to the company's workers, and I've got to do it in a way that won't make them angry. I've got to show them the necessity of having a common ground upon which they may stand with management and discuss their differences without costly strikes, strife and ill-feelings by all concerned. I've got to do it in a subtle way or they'll blow up and no one will gain.

The first step is simple. Establish reader interest. If I can make them anxious to get their copy of the publication each time it comes off the press, I've got my foot in the door.

Using Names Properly

One of the foremost factors involved in maintaining reader interest is sincerity. Absolute sincerity has got to stick out of the publication like a sore thumb. If there is one false note, it will be spotted. Sincerity is the keynote!

Of course I've got to mention names. But I don't have to use one of those chatter columns. The "Who was the cute little blonde Bill was seen with last night?" is a disgrace to the business. Instead, I'll get names into my publication through news stories, articles and items about the employees and their work and play.

And I'm not going to make the often-repeated mistake of using the same names over and over again. It's a little more trouble but it can be avoided and its worth the effort. I'll set up a card file system and list every employee in the firm. When someone is mentioned, I'll make a notation on his card. Then I'll try to keep from repeating too often those names already checked in the files. At least that's one way of doing it.

In connection with names, the publication will devote much of its space

... that counts!

with the actual field problems of gas distribution.

For the future greatly expanded and specialized research has been added to maintain and to augment an enviable record of achievement.

"Its the Inside that Counts" continues to be the informal trademark to characterize successful measurement with American Meter Company instruments.

AMERICAN
METER COMPANY
INCORPORATED ESTABLISHED 1836
Albany • Baltimore • Birmingham • Boston • Chicago
Dallas • Erie • Houston • Kansas City • Los Angeles
New York • Philadelphia • Pittsburgh • San Francisco • Tulsa

to news and feature stories of employees and their work. Naturally, each story will be handled in a manner calculated to bring out the highest possible amount of interest. Another interest-getting feature is the sponsorship and news of recreational activities. Sports, dances, dinners, picnics and all forms of employee get-togethers will be encouraged and then reported fully.

There are many things that may be employed to build reader interest. Contests, photos, hobbies are all grist for the mill.

When we have a publication which has reader acceptance we are ready for the next step, which is to promote pride in the company.

Now that we've got strong reader interest we're going to hold on to it. But we're going to make a few changes. They will be made with no noise, no fuss or bother. Still maintaining our sincerity, we're going to point up the industrial relations angles.

Foster Loyalty

Accident prevention and safety programs will be plugged to indicate the company's interest in the individual employee. The firm's suggestion system is also good for stories and may be approached from many different angles, all having the same focus.

Pride in the company and in the gas industry has been the immediate goal for which we've been working. Our next step is designed to foster loyalty to the company and to the industry.

We'll do it by showing the many, many ways in which the company is loyal to its workers. We'll still be perfectly sincere. The publication won't blatantly proclaim the fact, because that might provide the wrong note which could undo all we've accomplished so far.

"Good Company, Good Industry"

We can certainly indicate without fanfare that the firm is a good company to work for, that the industry is a good one to be in. We'll do it by indirection whenever possible by quoting a well-known and respected employee in the middle of a story for example, to that effect.

The "good company to work for, good indusry to be in," idea can be built on stories of employee benefits. Hospitalization, disability wage plans, retirement and pension plans, employees' credit union, and other company-sponsored projects for the workers make good material. And we're going to think of the company . . . we're going to get employees to thinking of the company as a member of the huge gas industry which produces manifold benefits for the sake of mankind. We're going to give them the overall picture so that they can fit themselves into it and visualize their own contribution.

Education Program

Just one last word. . . . Along with other benefits, the company's and the industry's history of stable employment and fair wage rates would be pointed up. We'll work in the whole story of the American free system of competitive enterprise. We will become, in short, a powerful factor in the education of employees.

Here, then, we've reached the ultimate goal. We have established our publication as a readable instrument both of entertainment and educational value to the employee. We merit his acceptance because we are honest in the use to which we put it. He will receive it at face value as a friendly and credible effort in his behalf.

Federal Bureau Tests Show Effectiveness of Vapor Barriers Against Condensation

THE desirability of vapor barriers as a safeguard against condensation in building walls has been demonstrated through laboratory tests conducted in the Heat Transfer Section of the National Bureau of Standards, a recent bulletin reported. The bulletin states:

"Ventilating the interior of the wall with air from the cold side was also found to be effective in reducing condensation. In these tests, specimen walls were exposed to cold air on one side and to warm, humidified air on the other side, under conditions a little more severe than those ordinarily expected anywhere in the continental United States.

Eight Walls Tested

"Moisture resulting from condensation of water vapor in the walls, or in other parts of a building, may cause serious damage either to insulation or to house timbers. It may impair the efficiency of insulation and shorten its life; or it may cause rot in the wood of the timbers.

"Eight specimen walls, each consisting of a different arrangement of insulation and vapor seal mounted in a specially constructed panel, were tested. The insulations included shredded redwood bark, both with and without a vapor barrier; wood; fiber blanket; rock wool without a covering (both with and without ventilation), with an untreated kraft paper covering, and with an asphalt-saturated kraft vapor barrier; and aluminum foil, itself a vapor barrier as well as an insulator.

"The panel, approximately 3 by 7 ft., was built of conventional materials, simulating ordinary frame-wall construction; that is, frame of 2- by 4-in. Douglas fir, inside face of plaster on metal lath, and outside face of shiplap siding on sheathing with sheathing paper between. The panel was fastened together with wood screws to facilitate assembling and dismounting. During tests the insulations were placed in the stud spaces.

"The specimen walls were mounted between two watertight boxes, one maintained at 70° F. and 30% relative humidity, and the other at —5° F., so constructed that the only water-vapor migration would be through the walls.

"Results of these tests are reported by Richard S. Dill and Herman V. Cottony in Building Materials and Structures Report BMS106, 'Laboratory Observations of Condensation in Wall Specimens.' In this report they show that condensation phenomena may be observed in the laboratory, and that in many cases the occurrence of condensation can be satisfactorily predicted by computations based on the water-vapor pressure and the laws of diffusion, provided the process is not complicated by air leaks in the vapor barrier. Data reflecting the migration of water vapor through the walls are presented in tabular form."

Seattle Wins "Oscar"

For publishing the "finest annual report for 1945 in the entire gas industry of the United States" the Seattle (Wash.) Gas Co. was given the "Oscar of Industry" at a dinner at the Waldorf Astoria Hotel, New York, Oct. 4. Presentation of the award was made to N. Henry Gellert, president of the company.

Donor was the publication "Financial World" of New York City, under whose auspices the dinner was held.

A Wisp of Smoke Led to a Sale

By WILIAM HELME
The Peoples Gas Light and Coke Co., Chicago, Ill.

IN making a "cold canvass" of his territory recently, one of our industrial sales engineers noticed a wisp of smoke drifting slowly out of a small stack on a two-story building. Now, the average industrial salesman might have passed the building by, as it is in a residential neighborhood and set far back from the street, but not this fellow. The smoke fascinated him. He decided to investigate. Over the door was a sign "New Art Studio." On entering and making inquiries as to the heating operations, he found that a solid fuel was being used in a pot-bellied stove to provide heat for drying statuettes and figurines.

These statuettes are made of molding plaster—sometimes called gypsum—and water. The liquid mixture or "slip" is poured into glue molds and allowed to set for 15 minutes. When removed from the mold still wet, the pieces are made up of about 50% moisture, which must be removed before they can be painted. They are first examined for defects, touched up where needed, and are then ready for the dry room.

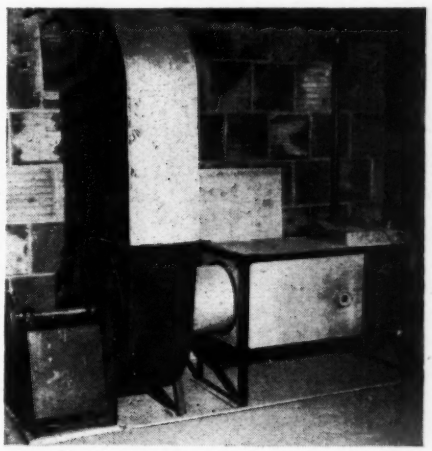
After the moisture has been removed in the drying process, the statuettes are sprayed with a quick-drying lacquer and sent to a special table for coloring. Girls are found best suited for this work, as it takes a steady hand and a keen eye to apply the various oil colors with artistic delicacy. As a final touch, the figures are treated with burnt umber to attain what is known as an "antique finish."

Our engineer was told that the method used for drying the work was far from satisfactory. The stove was frequently in need of repair and keeping it stoked with fuel was a source of constant irritation to the workmen. Moreover, it failed to perform the function for which it was being used—that is, to maintain a constant and even temperature in the room. The statuettes nearest to the stove were being dried too fast with subsequent cracking, while those farthest away were taking too long to dry.

To do this operation efficiently, it was determined that a uniform temperature of 140-150° F. must be maintained in the dry room at all times. Our engineer recommended: (1) that a direct gas-fired air heater be installed for this purpose just outside the dry room; (2) that a duct be provided to convey the hot air from the heater to the dry room, and (3) that an exhaust duct running to the outside be installed in the dry room to provide an escape for the moisture-laden air.

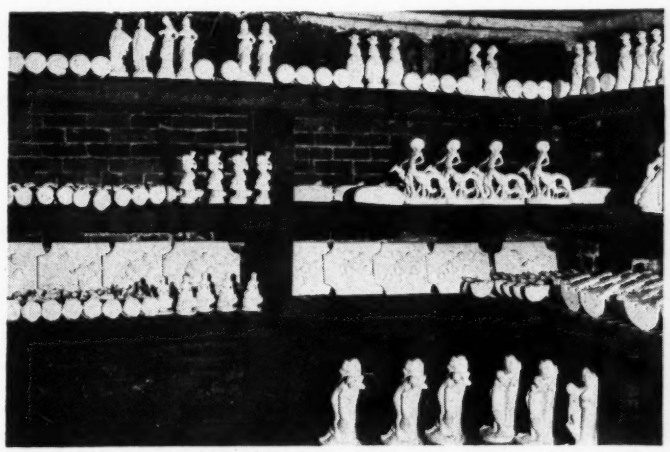
The customer questioned whether this operation could be done satisfactorily with gas and visited several places where similar work was being done with open flame burners. He was not entirely pleased with this method and decided to heed our engineer's recommendation to install a modern direct gas-fired air heater.

The equipment has now been installed about four months. It is the first of its kind to be used for this particular operation in the Chicago area and is operating to the complete satisfaction of the customer. The required temperature is maintained at all times and the operation is completely automatic. The workmen are happy too, as the drudgery connected with the stove has now been eliminated. About 600 statuettes are usually dried at one time. Based on the customer's present gas bills, six pieces can be dried for less than a penny. On a fuel cost basis alone, gas has proved to be cheaper than the former method.

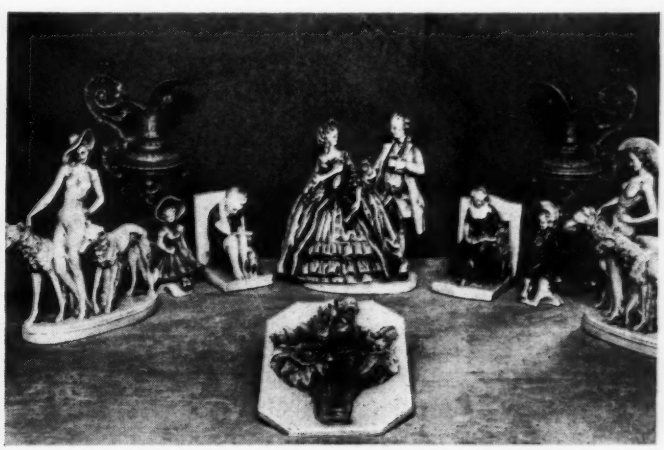


Modern direct gas-fired air heater dries statuary at the New Art Studio, Chicago.

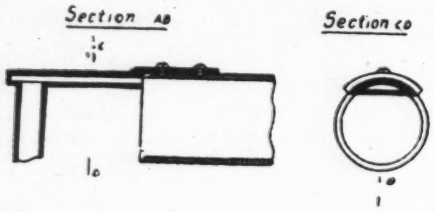
The dry room holds 600 figures. Drying time, 8 to 12 hours.



The finished product. Each year 300 new models are designed.



Low Temperature Heating with RADIANT TUBES



By M. R. DUCHENE,
Paris Gas Co., Paris, France

DURING the industrial gas congress of 1939, Arnold de Grey, engineer of the Surface Combustion Corp., indicated in a very detailed description how heating by "radiant tubes," largely practiced in the United States, permits obtaining by means of gas the operation of industrial thermal equipment under conditions equivalent, from the technical point of view, to those which it is possible to realize by means of electrical heating. In addition, the author emphasized the by-no-means inconsiderable advantages which it is possible to obtain in the way of lower operating costs.

For industrial furnace work, the Surface Combustion Corp. had specialized in the domain of heating high temperature furnaces, and particularly in the heating of furnaces of large dimensions, with large section tubes, the diameters of which range between 76 and 127 mm.

Neglected Field

A very interesting field of application has been relatively neglected up to now, this being the one of *medium temperatures*, i. e., those temperatures below a dull red: These are in frequent demand by the light industries, in which the furnaces used are also frequently of relatively modest dimensions, e. g., stoves of various types, bakers' ovens and ovens for biscuits and cake making, cooked meats; under this heading also even comes domestic heating by means of radiators and stoves.

It has been considered by the author that the fact of imposing a limitation to low temperatures of the order of a dull red should permit application of modified simplifications in the technique of combustion in tubes, and as a result reducing to a notable extent the installation costs of the equipment. It will be shown in the following matter that one can, with certain reservations, obtain correct combustion in tubes with burners of an extremely simple design and without the need for any suppressive apparatus.

The burner adopted by the Surface Combustion Corp. for equipping each tube is a somewhat complex piece of equipment. It should be considered that the combustion in the tube is effected in two phases: the first phase is the production of the pilot flame (about 10% of the gas), whose role is, on its arrival at the center of the main combustion field, to diminish the combustion velocity of the latter and thus, as a final effect, to obtain a more elongated flame. An air compressor is necessary to form this pilot flame. In addition, the gas is delivered to the burner at a pressure of 500 mm. (20 in.) of water, and a fan exhauster must be placed at the end of the tubes in order to maintain these at a lower pressure.

Practical experience has demonstrated that it is possible to produce in a tube of any given cross section a flame extending to a considerable length of the main combustion area, while obtaining a complete combustion if the condition be fulfilled that a certain pressure level difference exists between the entry and exit orifices.

The Burner

The burner reduces itself to a short tubular element, presenting a section in the shape of a circular segment; it is fixed at the extremity of the radiant heating tube, in the manner shown in *Fig. 1 (above)*.

It is possible to impart the most varied forms to the radiant heating tubes; they may be a simple tube inclined to the horizontal, a horizontal element prolonged by a vertical element (see *Fig. 2A*), or a succession of rectangular elements united at the elbows *(Figs. 2B* and *2C)*. It is also possible to arrange a series of tubes in parallel, venting into the same common collector.

The mechanism of the combustion occurring in the tubes is as follows: When the gas, under pressure of only a few millimeters of water, is admitted to the burner, it passes through the heating tube in a striated, laminated flow, and the density of the gas, being lower than that of the air, maintains this flow the length of the principal combustion area. When the gas is lit, one sees a flame stretch like a sheet, perfectly regularly, along the whole of the main combustion tube. A suitable regulating control permits extending this sheet of flame the entire length of the first tubular element.

The extension of the flame results from this striated flow and from the fact that the contact of the gas with the air in free circulation at the lower part of the tube can only be produced step by step by the horizontal surface of separation between the two gaseous systems.

Excellent Spreading

It will be realized that such a flame having been achieved, there will be as a result an excellent spreading of the heat of combustion along the length of the tube. In *Fig. 3* is shown the curve of the temperature distribution along the length of a tube 53 mm. in diameter (internal). For comparison, on the same figure is reproduced as a dotted curve the temperature distribution given by a burner fed at normal pressure with air entrainment. The maximum amount of gas that one can thus burn correctly in a tube is a function of the section of the tube, the pressure level difference between entry and exit, the shape given to the tube, and the heat exchange conditions between the tube and the exterior.

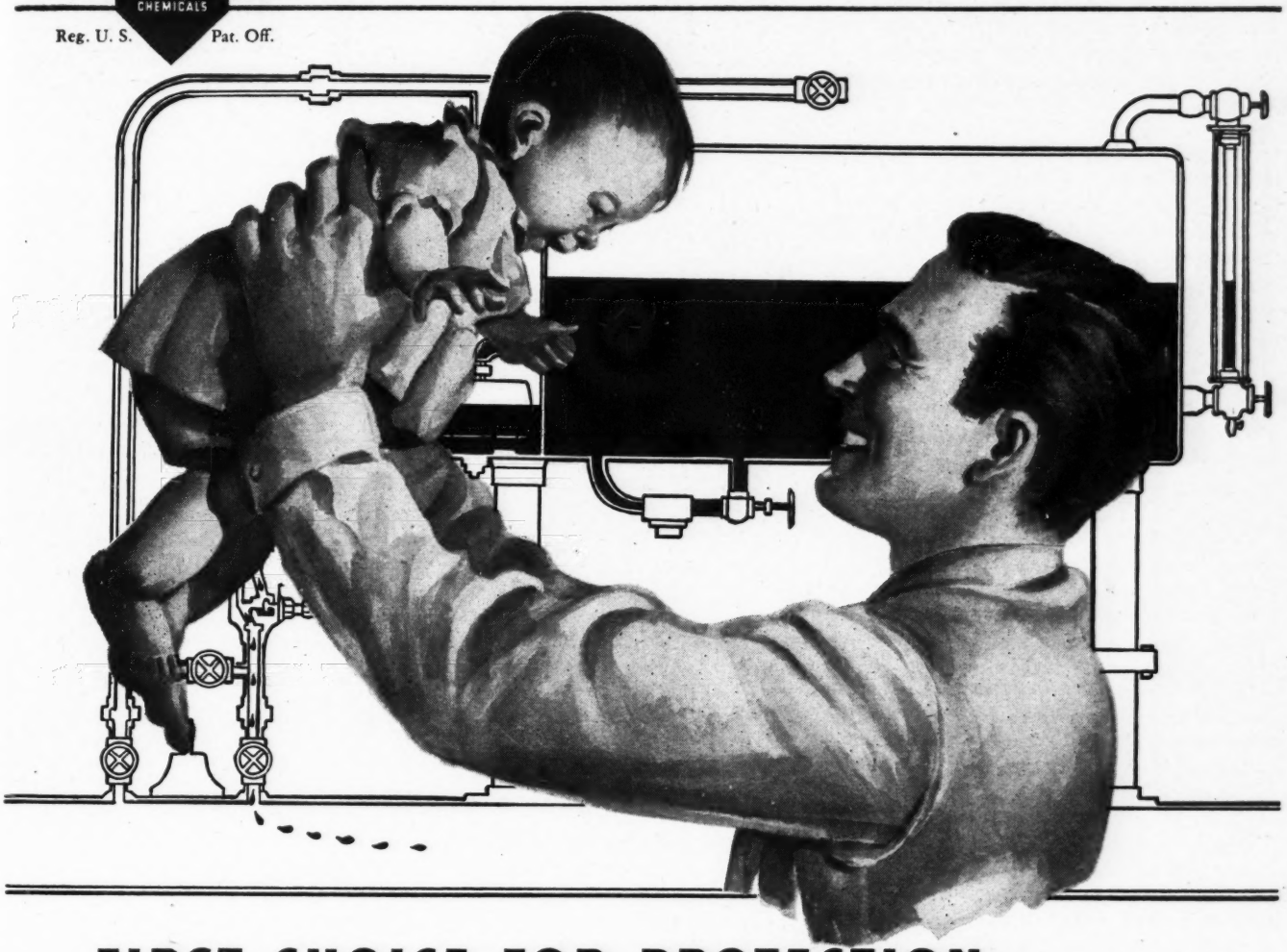
In *Fig. 2* are shown the gas consumption values corresponding to different tubular profiles. The fact that the tube is connected to an evacuating chimney is equivalent to utilizing a much greater difference in pressure level between the entrance and exit ends of the tube, and allows a greater possible gas consumption.

This article originally appearel in the French magazine, "Journal des Usines a Gaz."

ORONITE CHEMICALS

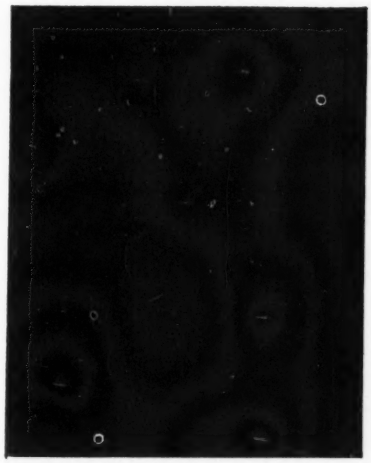
Reg. U. S. Pat. Off.

THE NAME TO WATCH IN CHEMICALS



FIRST CHOICE FOR PROTECTION...

CALODORANT



No price can be quoted on human safety. Where it comes first, the best gas odorant is the one that *smells* like gas to a layman.

The intense, penetrating, "gassy" odor of Calodorant* has never been even closely duplicated by any warning agent on the market today. Completely suited to the requirements of all gas distributors, large or small, Calodorant is more widely accepted throughout the industry than all other odorants combined. It's practically insoluble in water, burns as completely as the gas itself, is not absorbed by the mains, is neither toxic nor nauseating, and is inexpensive.

For safety's sake, use Calodorant.

TYPICAL TESTS:

Gravity, A. P. I.	49.5°
Weight, lbs. per gal.	6.5
Distillation (D-86):	
First Drop	161°F
50% Recovered	220
70% Recovered	259
90% Recovered	320
End Point	375
Recovered	98%
In Flask	1
Loss	1
Vapor Pressure, Reid, lbs. per sq.in. @ 100°F	3.4
Hydrogen Sulfide	None
Acid or Caustic	None

*REG. U. S. PAT. OFF.

1181

ORONITE CHEMICAL COMPANY

Russ Building, San Francisco 4, California
White-Henry-Stewart Bldg., Seattle 1, Wash.

30 Rockefeller Plaza, New York 20, N.Y.
Standard Oil Bldg., Los Angeles 15, Calif.

It will be obvious that these conditions could not be obtained if the gas consumption varied a litile one side or other of an optimum value. To consolidate ideas on gas consumptions that it is possible to obtain, reference may be made to *Fig. 2*, where are shown the optimum consumptions for heating tubes of various interior sections (22 mm. and 53 mm.), and of different lengths and diversity of shapes.

For the reasons indicated above it is indispensable, particularly for domestic gas burning equipment with a relatively small gas consumption, and for which accordingly a chimney is not necessary, to ensure constancy of the gas consumption figure. This factor renders the employment of a pressure regulator as a necessary adjunct. There are excellent types of this equipment available, and in normal times this requirement presents no difficulty.

Pressure Regulator

The problem becomes somewhat more complicated in that case where the distribution pressure varies systematically between large limits during the course of the day. No regulator is able ordinarily to insure constant pressure under these conditions. In order to avoid the use of any manual intervention, which is always undesirable, the author has used a modified regulator as shown in *Fig. 4*, which provides a solution to the problem. While the pressure is raised (period of distribution under normal pressure) the principal valve is closed, and the gas only passes by means of the valve bypass. As soon as the pressure falls to a certain value (20 mm. for example), the main valve opens and then assumes the normal role of regulator.

The amount of gas that it is possible to admit into each tube being relatively small and the flame well extended, the temperature of the metal remains below 400° C. Under these conditions of operation the more normal metals may be utilized for the construction of the heating tubes, on the stipulation, however, that the external surface of the tube has an emissive power approaching that of a black body. This stipulation rules out the use of metals with a bright or even a brilliant surface. Tubes of cast iron or of lightly oxidized steel are quite suitable for the purpose. If it were desired to employ tubes of aluminum, it would be necessary to coat them with a layer conferring on the surface the property of black body radiation (soot for example).

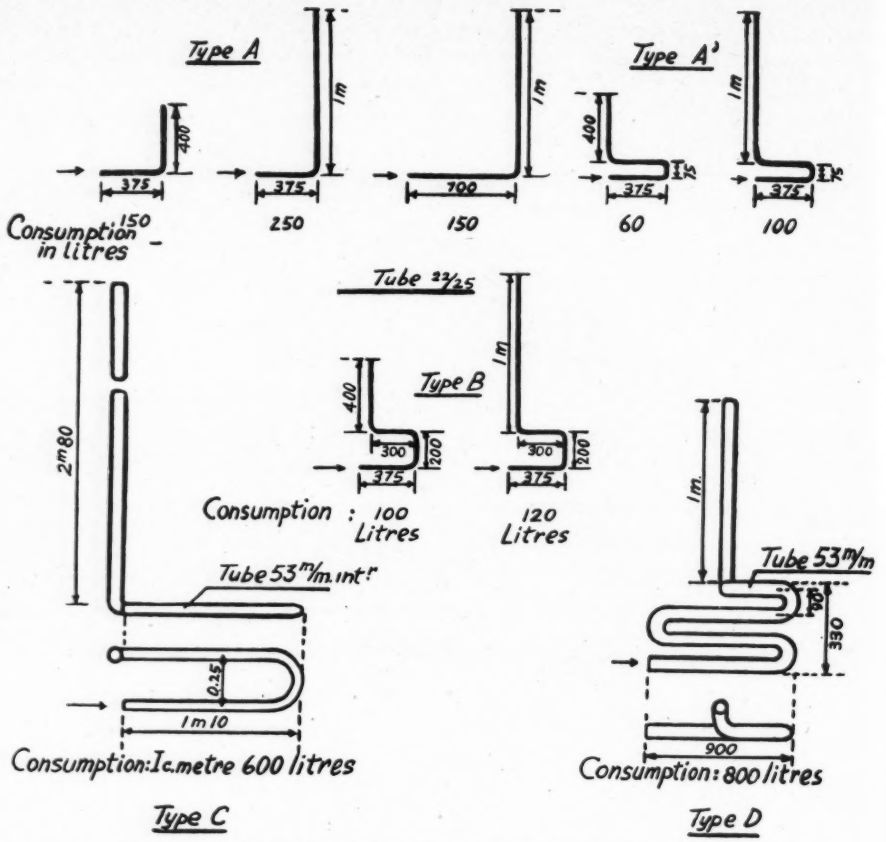


Fig. 2. Possible shapes of tubes, with gas consumption values.

It is equally possible to use tubes of refractory material with a good emissive factor; a further advantage here is that in contact with this material the combustion is more complete.

The employment of tubes operating at not very elevated temperatures permits the location, in the immediate proximity of the tubes, of reflective surfaces without any fear that these will deteriorate rapidly, and this possibly permits directing to the regions of utilization all the radiation which is being emitted. In addition, polished metals, such as aluminum or tinplate, have a reflectivity factor bordering on unity for radiations of the longer wave lengths, such as infra-red radiations, which is precisely the type of radiation that is emitted by a body at a low temperature. Thus, it is possible to augment the useful effect of the heating by very notable proportions by employing reflectors of this type, which are quite easy to install. The diagram in *Fig. 5* shows how it is possible, with an arrangement of a tubular heat emitter and a reflective surface, to recuperate toward the regions of utilization the radiations which would otherwise be ineffectively used.

In the present work, the examples of

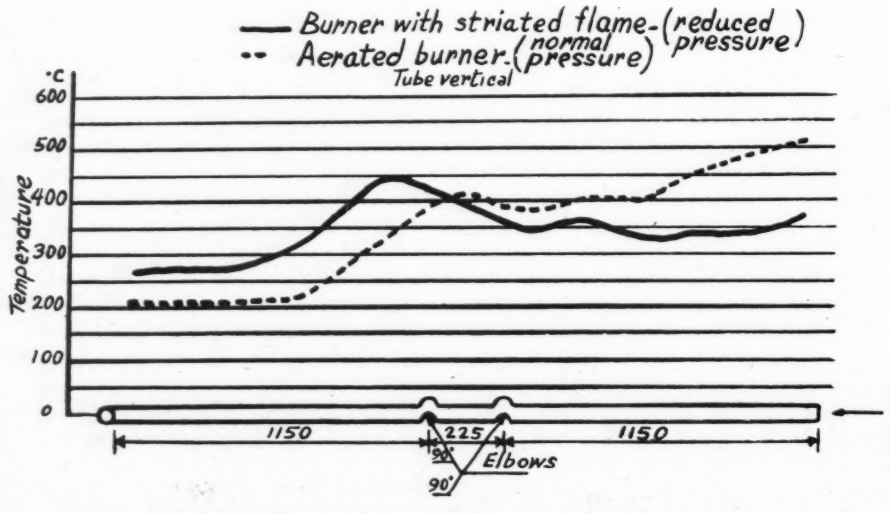


Fig. 3. Curve of temperature distribution along 53 mm. tube.

application of this heating system will be confined to two types, of which one is applied in the industrial domain and the other in the domestic field.

The principle of the above equipment was applied to the drying of a sensitive emulsion on a roll of paper, one meter in width and of indefinite length.

The principle of the installation is as follows: the paper as received in the form of a roll, is unrolled to make a horizontal band, six meters in length, which is supported by cylinders. The impregnation is effected quite close to the roll by means of a coating cylinder, and the drying must be effected on this

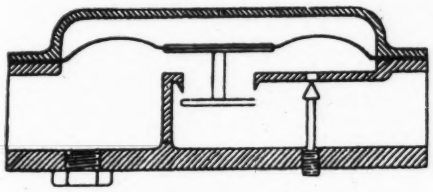


Fig. 4. Modified regulator used.

length of six meters as the paper is re-rolled at this distance.

For drying, the installation comprises three drying stations composed of a tandem arrangement along the length of the unrolled band, the first station being located immediately after the emulsion has been applied, the second at the middle of the run, and the third just before re-rolling. Stations one and three consisted of a heated plate placed on the band of paper, and station two of a hot point in the real sense of the term. The two heated plates and the hot point were heated by means of multiple gas burners similar to the heating burners employed in kitchen equipment. Drying by this equipment was effected in a very unsatisfactory manner and the gas consumption was quite an operating consideration.

When the new method of heating was installed, the plates disposed between the flames and the paper became obsolete, and it was possible to lead the radiant tubes to the immediate neighborhood of the band of paper. Working in this manner, each of the two end plates was replaced by a radiant tube of hairpin shape, disposed transversely to the band. As regards the central station, the hot point was heated by three radiant tubes, placed side by side and of identical design to the preceding ones. Each tube burned two cu. meters of gas. Thanks to the close approach made possible with these heating elements to the band of paper and also to the employment of aluminum reflectors placed over the tubes and reflecting the radiation emitted downwards, it was possible to achieve a working economy of 30% on the gas consumption and to obtain a perfect drying effect in operation.

A space heating radiator is shown in *Fig. 6* and is constituted by:

(1) A single metallic tube, open at the two extremities and bent in S form several times on itself in the vertical plane. The metal constituting this tube possesses a high emissive factor, such as for example, cast iron. One of the extremities of the tube receives the burner and the other is the exit end.

(2) A burner as described in detail in *Fig. 1*, which effects a laminated flow of the gas and air along the major portion of the tube (1) in such a manner that when the gas is lit, one obtains a flat, striated flame, without turbulence, along the complete length of the upper portion of the first tubular element and even beyond this.

(3) A profiled reflector of polished metal placed behind the tube, whose role is, on the one hand, to suppress the unwanted useless radiation towards the rear and, on the other hand, to spread uniformly the radiation in the area of utilization in such a manner as to reach a man standing, from head to foot, situated at a distance at 2.5 meters from the equipment.

(4) Either a pressure regulator, if the gas distribution is effected at a pressure that is reasonably constant, or else a gas flow regulator for consumption if the mains pressure be subject to somewhat large variations.

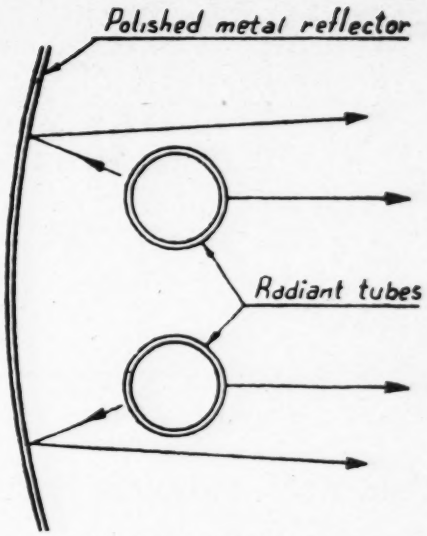


Fig. 5. Polished metal reflects radiations.

as is actually the case in the Paris region where distribution is effected under reduced pressure at certain hours and under a pressure of 80 mm. at the normal loading hours. This consumption or gas flow regulator permits a correct gas consumption during these two variable periods.

(5) A control, the effectiveness of which is regulated by a butterfly.

Heating at medium temperatures by radiant tubes may be applied to bakers' ovens of all types, and has the advantage of giving continuous operation.

Ovens for domestic cooking or for butchers engaged in the cooked meats industry have been installed with radiant tubes of a small diameter covering the interior of a well heated oven.

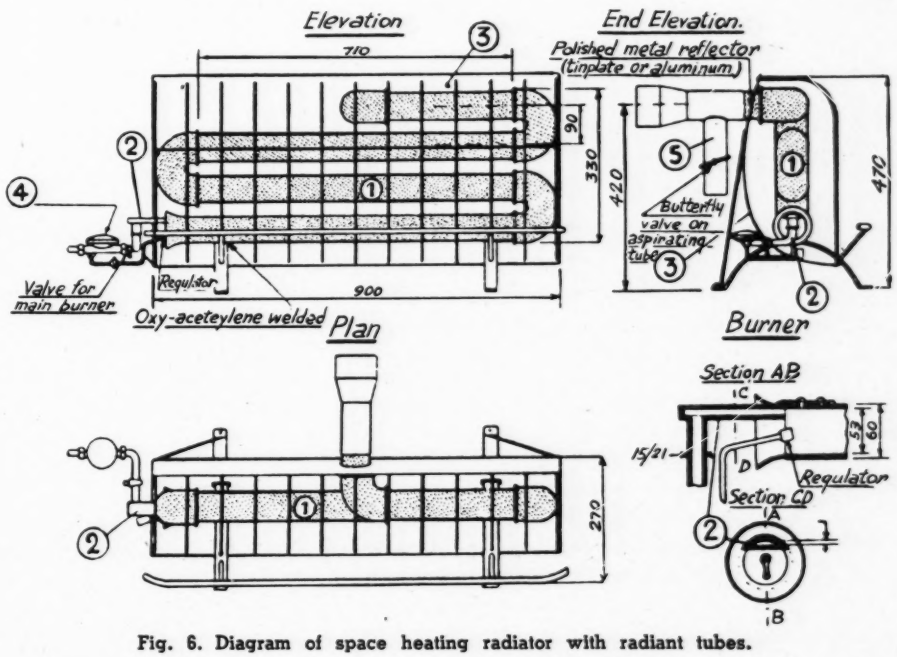


Fig. 6. Diagram of space heating radiator with radiant tubes.

TECHNICAL TRENDS

By GUY CORFIELD, Technical Editor

Reverse Refrigeration

PERIODICALLY, when the discussion turns to space heating methods, reverse refrigeration is mentioned. One of the simplest ways to define or to visualize the principle of reverse refrigeration is to consider the domestic refrigerator, which is actually a mechanism that removes heat from the refrigerated space (via the cooling or heat absorbing coils or surfaces in the food compartment) and discharges this heat into the surrounding air space (via the heat radiating coils at the back or top of the refrigerator). Theoretically at least, it would therefore be possible by use of a refrigerator to heat space, such as a building, by placing the heat absorbing coils outside the building so that they could absorb heat from the atmosphere, which heat would be released inside the building from the heat radiating coils. In other words, if a domestic refrigerator were inserted in the outside wall of a room with the food compartment outward and the door open, and the heat radiating coils inside, the room would be warmed by heat abstracted from the outside air. The mechanism of reverse refrigeration is also sometimes called the "heat pump," a very descriptive term inasmuch as heat is in reality pumped from one temperature level to a higher level. It is significant that by this process heat can be obtained and made available by application of mechanical energy only and without the direct combustion of fuel. It can also be seen that, by simple mechanical reversal of the overall operation, a building could be cooled in the summer and heated in the winter by the same apparatus.

From a practical standpoint, while the outside atmosphere could be considered as an infinite reservoir of heat, it would be at a very low level during the winter heating season except in temperate climates, so that the "pump" would have to work very hard and be at the greatest disadvantage when it had the most work to do. Much better operation can be obtained if underground water such as well water is available as the external source from which the heat is to be abstracted.

The theoretical possibility of reverse refrigeration was conceived at least 90 years ago, and mechanically realized not more than 15 years later. Since then a considerable number of practical heating installations have been made and operated with various degrees of success, but very little competition with fuel combustion has developed except in Switzerland and possibly other countries where combustible fuel is scarce but mechanical energy in the form of hydro-generated electricity is abundant. However, it would seem that the gas industry should keep well abreast of all developments in a heating-cooling application as close to its interests as this seems to be. Furthermore, it may be less marginal for some applications and in some areas, than is generally understood. In fact, the article on Page 52 of this issue, by Louis Wollenberger, entitled "Gas Companies Should Promote All-Year Air Conditioning," discusses a winter-summer air conditioning package unit, for domestic application, using electricity for mechanical energy, which is assertedly coming on the market in competition with conventional gas fuel equipment.

A New Material

ON Page 40 of the October 1946 issue of GAS, an article entitled "Plastic Tubing for Gas Service Piping" described the general appraisal, selection, testing and installation of plastic services as a substitute for conventional metallic piping. While these initial installations may be considered as on a substitute basis it is quite possible that this plastic material, or some modification or later development of it, may exhibit superior performance and become a standard material for medium or low pressure distribution if not for general underground piping use.

It was with exactly this type of development and adaptation in mind that the paragraph headed "What the Gas Industry Needs Is . . ." in Technical Trends of August 1946, was written. In this paragraph it was suggested that materials and methods, either developed during the past war or delayed because of it, may be available for the taking if the gas industry will make the initial approach and provide tangible encouragement.

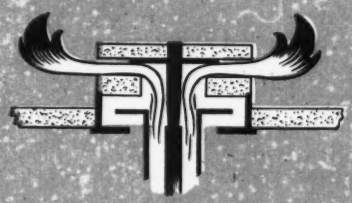
Specifically, the potentialities of plastic materials for underground piping have no doubt been only partially explored. However, last month's article on "Plastic Tubing for Gas Service Piping" with its description of the problems involved and the test methods developed for evaluation, is in reality a *blueprint for research* on the subject. A plastics research organization provided with adequate funds, and with this "blueprint" as a basis and a gas industry advisory committee to work with, would seem to be the logical combination for progress.

The extent to which the plastics industry is organized for cooperative effort is not clear from a study of the available literature, but a recent editorial in "Modern Plastics" discusses "the Society of the Plastics Industry" as located at 295 Madison Ave., New York 17, N. Y., and also mentions the "S. P. E.," which is presumably the Society of Plastics Engineers.

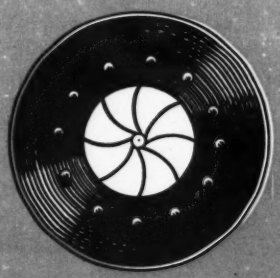
In operating efficiency . . .

The Gordon *Spreader - Flame* Burner

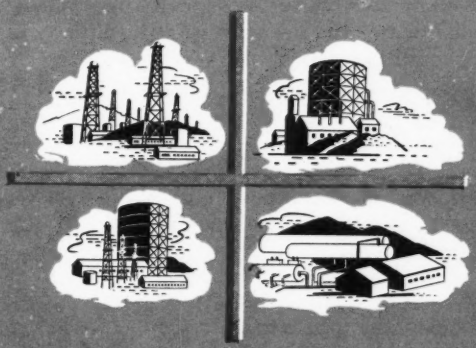
challenges comparison with any other type



THE GORDON burner, with its baffles and air-seal features prevents secondary air from entering the combustion chamber and thus produces a mushroom flame which instantly scrubs every inch of furnace or boiler walls with intense heat.



THE GORDON burner uses the patented iris orifice, designed like the aperture of a camera. The volume of input up to 600 cu. ft. per hour is instantly controllable by a flip of the finger, yet the orifice can be safely locked in any desired position.



THE GORDON burner is readily adaptable to all types of gas—manufactured, natural, mixed or butane-air with a simple adjustment of the iris orifice and the air collar. No major change of parts is required. Saving per customer estimated to be $15.

ROBERTS-GORDON APPLIANCE CORP., 137 ARTHUR ST., BUFFALO 7, N. Y.

Represented by:

Look in the list for the representative nearest to you.

Alabama, Birmingham 3
S. C. Bratton
405 American Life Bldg.

Illinois, Chicago 5
Ruud Humphrey Co.
1223 So. Wabash Ave.

Indiana, Indianapolis 4
Brooks Morris
5047 N. Capitol St.

Massachusetts, Boston 16
Herbert H. Skinner
250 Stuart St.

Michigan, Detroit 21
E. C. Lamlein
12768 Grand River Ave.
Phone Hogarth 0154

Missouri, St. Louis 8
Roberts Gas
Appliances, Inc.
9 S. Vandeventer St.

Nebraska, Omaha 11
J. G. Cameron
579 Insurance Bldg.

New York, Metropolitan
John C. Fullerton
292 Madison Ave.
New York 16

New York, Buffalo 13
W. A. Hasmond
261 Highland Ave.

New York, Rochester 7
Wm. J. Gillette
196 Chestnut St.

Ohio, Cincinnati 2
F. J. Scull
626 Broadway

Ohio, Westlake
R. E. Landers
3606 Dover Center Rd.

Pennsylvania,
Philadelphia 22
Porter Hurd
1500 N. 8th St.

Pennsylvania, Pittsburgh 19
Ridge Appliance Co.
1505 Berger Bldg.

Texas, Dallas 5
E. H. Durning Company
1067 Santa Fe Bldg.,
2nd Unit

Utah, Salt Lake City
W. L. Peterson
733 East 3450 South St.

Wisconsin, Milwaukee 3
J. H. Fagan
161 W. Wisconsin St.

PROMOTIONAL NOTES and NOTIONS

By STANLEY JENKS

Convention Impressions

The columns of this issue tell the story of the 28th A.G.A. Annual Convention and Exhibition at Atlantic City, Oct. 7-11, when over 6000 members of the gas industry met to take a postwar peep at each other and find out the score. This page covers the observations and impressions of a veteran conventioneer like myself, who found much joy in meeting again old friends, only marred of course by the many gaps in the ranks, a tragic reminder that the last five years of total war have taken more than their normal anno Domini toll.

The American gas industry did its war job remarkably well. It suffered its casualties. Today, it is licking its wounds, but I am sure that everybody at Atlantic City shares with me the solid conviction that its position in the scheme of things has been enhanced rather than impaired. The program, the discussions, both on the platform and among the informal groupings of the brethren, were sufficiently constructively critical to show that our many industry problems will be faced intelligently and realistically.

The Exhibit

The manufacturers put on the best show of all time, and I am glad to endorse Carl Wolf's public appreciation of the efforts of Harold Massey, of the GAMA staff, who managed the display so successfully. The program listed 138 exhibitors, ranging from gas controls to ditch diggers, conversion burners to heavy-duty cooking equipment. It was a reassuring picture of the equipment, weapons, and ammunition the gas industry has available for the forthcoming battle of the fuels. It is hard to figure the mentality of any gas utility man who deliberately or unconsciously (which is worse) discourages the sale of any of it in his territory. And there'll be more and better equipment soon. Several manufacturers told me that current material shortages had forced them to keep many developments under wraps. However, there were some very important innovations on view.

Fourth Zone Steam Oven

This is a new development, which fortifies more than ever the supremacy of gas cooking.

A Kansas City idea made practical by the Vendo Co., it got a big play on the exhibition floor, and was effectively and convincingly demonstrated by Colleen Fowler, home service director, Kansas City Gas Co., on one of the programs of the Residential Section. As a remarkably unskilled skilleteer, but a moderately (oh, yeah?) food-minded male who thinks he knows his onions, I know the gas industry really has got something when you can cook a pudding and a couple of live lobsters simultaneously in the same oven, without any interchange of flavor.

The cooking is done in a special oven with live steam generated by a small gas burner. It will be incorporated in forthcoming models by the better gas range manufacturers, or will be available a sa separate unit.

The fourth zone steam oven ranks as a major advancement in the art of gas cooking, and nobody regrets more than I its present unavailability, because I like lobster.

And while Miss Fowler has a myriad of other than cooking uses for it, how about using it as a humidifier in those radiator-heater homes, where sub-Saraha Desert dryness in the winter causes respiratory illnesses?

All Together, Boys

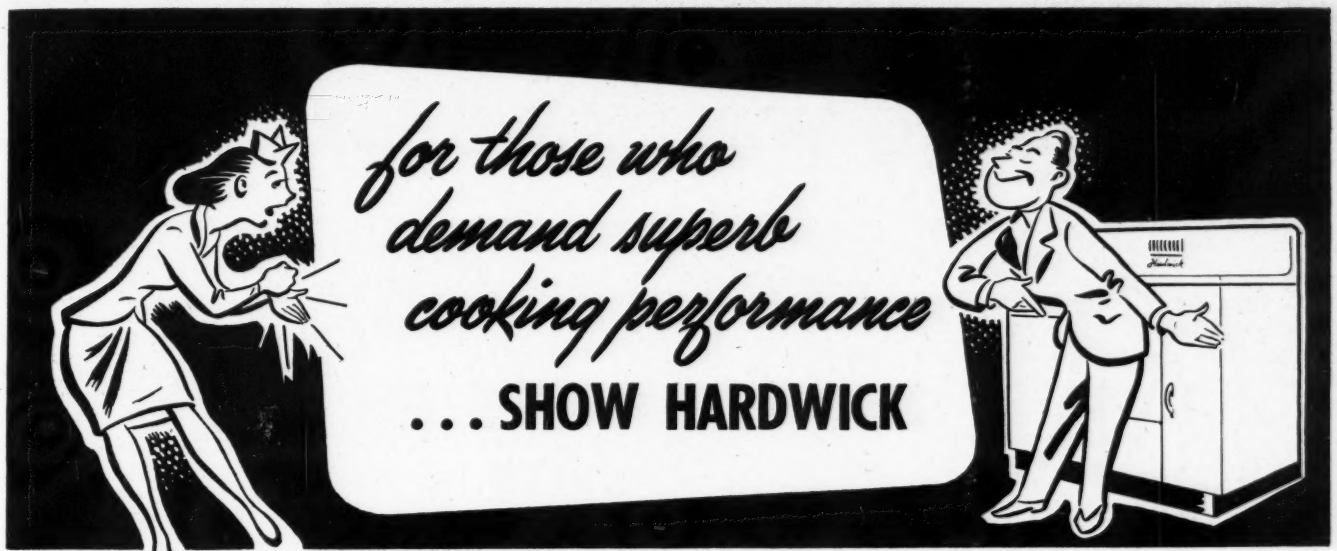
It is one thing to have an excellent piece of equipment; it is another thing to have a sales policy in tune with the times. The El Van Ayre Corp. of Detroit has both. It has a conversion burner that clicks with me because its designer has seemingly tried—and successfully, too—to see the utility viewpoint, which, when all is said and done, is that the gas company is primarily concerned in rendering a highly satisfactory and dependable heating service.

The El Van Ayre automatic electric lighter, which reignites the safety pilot should it go out, within four or five seconds, is an added safety feature which a safety-minded industry will welcome. Then there is the patented combination burner and pilot valve, which makes it impossible to open the burner valve until the pilot is lit, or to turn off the pilot until the burner is turned off. Mechanical details, if you please, but what is quality anyway but a meticulous concern for detail?

The El Van Ayre distribution plan, as outlined to me by President J. E. Van Tuyl, appeals to me strongly as being in tune with the liberalized dealer sales participation plans being formulated by more and more gas utilities. According to Mr. Van Tuyl, once a utility approves his burner in its territory, his organization will take off its coat and go to work. The first move is the establishment of a local central factory installation and service organization, expertly trained to follow utility installation requirements and render 24-hour service. Dealers or agents do the selling. The local factory group is financed by an adjustment in the dealer's margin. There is also a hold-back placed in a local fund for servicing and maintenance. At the year's end, any surplus in the servicing fund is rebated pro rata to the El Van Ayre dealers.

The plan has everything that ought to appeal to gas utilities eager primarily to build their heating load. It asks no utility dealer subsidies, nor does it propose any down-grading of the utility's high service standards or practices. All it requires is the utility's practical cooperation, and by "practical" I mean more than lip service, but an end to any sales policy that condones the practice of paying utility sales representatives to take sales away from El Van Ayre or any other reputable dealers.

It will be interesting to see what success awaits Mr. Van Tuyl's program.



Predominant

ON TOP

IN THE OVEN

IN THE BROILER

PRICED TO SUIT 8 OUT OF 10

TOO EXPENSIVE FOR ONE

JUST RIGHT FOR EIGHT

NOT ENOUGH GADGETS, NOT EXPENSIVE ENOUGH FOR ONE

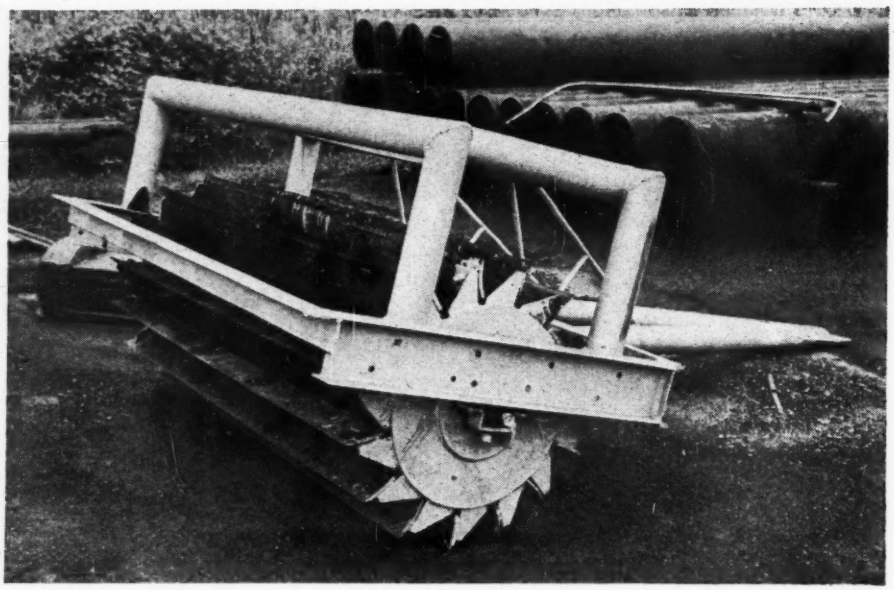
HARDWICK Gas RANGES

HARDWICK STOVE COMPANY
CLEVELAND, TENNESSEE
The Quality Line Since '79

OPERATING IDEAS

Right-of-Way Weed and Brush Cutter

SUGGESTED by D. P. May, United Gas Pipe Line Co., crew foreman, Jackson, Miss.



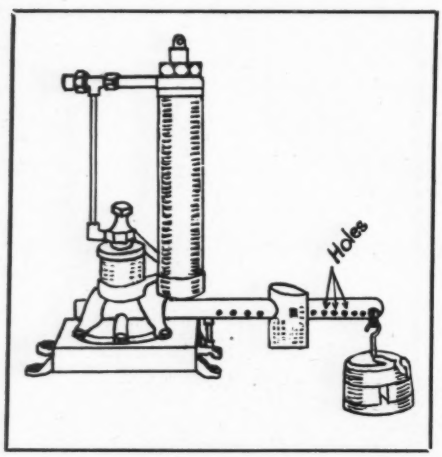
To aid in keeping pipe line routes clear of undergrowth, this weed and brush cutting machine was constructed of junked pipe and other scrap materials by district crewmen. The cost is nominal, and the machine has proved very effective in use, according to E. W. Thompson, section foreman of the Jackson section.

The right of way weed cutter, which weighs about 2000 lbs., is constructed so that additional weight can be added when necessary. It has 15 6-ft. long blades, ½ in. thick by 6 in. wide and spaced 8 in. apart. The diameter of the blade circle is 34 in. Overall height is 50 in. and length is 8 ft. A tongue and coupling for hitching to tractor or team are provided on the cutter.

Making a Damper Regulator More Sensitive

SUBMITTED by W. F. Schaphorst, M.E., 45 Academy St., Newark, N. J.

It is well known that damper regulators of the type shown in the accompanying sketch are "quick on the trigger" for handling dampers, but one user wanted his to be still quicker, and he discovered that he could increase its



sensitivity by drilling holes along the lever arm as indicated. The weight at the extreme right could then be moved inward any desired distance, thus giving the lever arm its "best length" for his purpose, which he determined by experimentation. In that way he made the regulator sensitive enough for use where quicker control is needed.

The closer the weight is to the fulcrum, the less its velocity when moved upward, which explains why the shorter lever arm is more sensitive. Energy is directly proportional to the weight and varies as the square of the velocity. In other words, the velocity of the regulating weight should be kept low where sensitivity is essential.

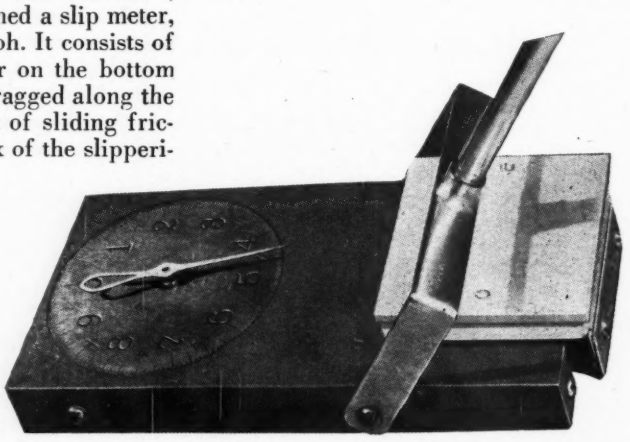
"Slip Meter" for Safe Floors

EXCERPT FROM "Something New on Floors" presented at the Pacific Coast Gas Association in San Francisco by P. S. Farnham and J. T. Cortelyou.

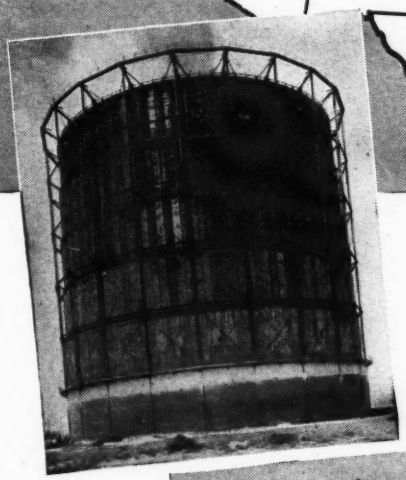
Since early in 1945, the Southern California Gas Co., Los Angeles, has had under way a floor maintenance program as an activity of its building maintenance department. The program, which is based on safety, appearance, cost, and preservation, stresses the first of these.

To indicate the slipperiness of floors, the company has obtained a slip meter, shown in the photograph. It consists of a piece of shoe leather on the bottom of a weight which is dragged along the floor, the total amount of sliding friction (which is an index of the slipperiness) registering on an ordinary spring scale. The scale is arbitrary, but experience has shown that a reading of 3 lbs. indicates a safe floor. Readings greater than 3 lbs. indicate a greater degree of safety and readings under 3 lbs. indicate a progressively more slippery floor.

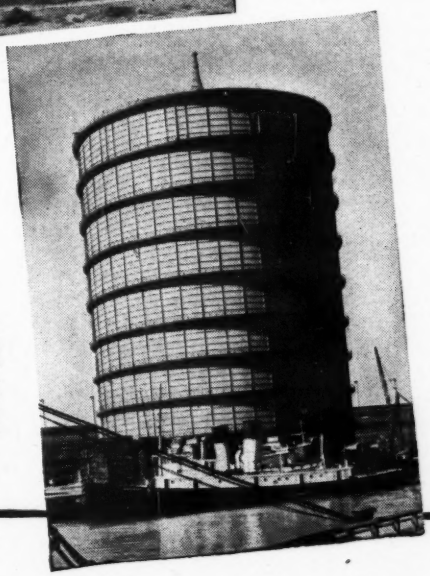
The slip meter is not entirely accurate, as readings may vary with different operators. However, if floors are shown to be safe according to the meter, the company is satisfied, and the accident rate has decreased noticeably since Southern California Gas initiated this program.



51 100,000 to 10,000,000 CU. FT. ALL-WELDED GAS HOLDERS



Largest all-welded, wet seal gas holder in the United States—5,000,000 cu. ft. capacity. Installed by Stacey Brothers Gas Construction Company at Long Beach, California.



Largest all-welded, dry seal gas holder in the United States—10,000,000 cu. ft. capacity. Installed by Stacey Brothers Gas Construction Co., at Dearborn, Michigan.

Who built the largest all-welded, panel type gas holder in your vicinity?

Chances are, the answer is *Stacey Brothers Gas Construction Company.*

We say "chances are", because we've built *more than 60,000,000 cubic feet of holder capacity.* The largest of these installations—100,000 to 10,000,000 cubic feet—are shown on the map. Note, particularly, how many of them have been repeat orders. In addition to these big ones, we've designed and constructed many, many smaller ones—even down to 100 cubic feet.

You have only to make a personal inspection trip to any one of these installations and you'll know why Stacey Brothers has been the choice of so many operators. You'll see a holder that's not only good to look at—it's even better to operate! A mechanically round structure, free of unsightly deformations, is one clue to trouble-free, dependable, *economical* operation.

Since we first introduced the famous patented all-welded, panel type construction in this country we've had more experience in building all-welded holders than any other company. You can capitalize on that experience.

May we arrange an inspection trip for you?

STACEY BROTHERS GAS CONSTRUCTION CO.
One of the Dresser Industries
5535 VINE STREET • CINCINNATI 16, OHIO

Stacey Brothers
ALL-WELDED GAS HOLDERS

NEW PRODUCTS

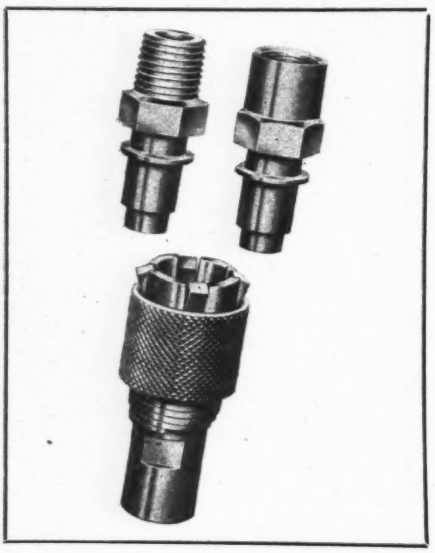
Air Hose Coupling

E. B. Wiggins Oil Tool Co., Inc., 3424 E. Olympic Blvd., Los Angeles 23, Calif.

Model: Wiggins Quick Connect Leakproof Air Hose Coupling.

Application: Eliminates wasteful leakage of air since it is guaranteed leakproof under working pressures up to 1000 lb. Besides air, the coupling will handle oxygen, oil, aromatic fuel and kerosene. The company states that other improved features save time, materials and money wherever air is used in fabricating and processing.

Description: The coupling body has ¼-



in. female pipe threads and is available with or without self-sealing valve. A choice of two nipples is provided. The entire unit is made of solid aluminum bar stock. Ease of service is emphasized, and to change gaskets requires only a minute. No wrenches are required, and the coupling body remains intact while the gasket is removed and replaced. A quick down-pull and push-up on knurled ring to connect the coupling, and a quick pull to disconnect it, effect time savings as high as 85%, according to the manufacturer.

Conversion Burner

L. J. Mueller Furnace Co., 2005 W. Oklahoma Ave., Milwaukee 7, Wis.

Model: Climatrol Type 500 Gas-Fired Conversion Burner.

Application: Approved by A.G.A. for installation in coal furnaces and boilers. Factory-assembled for fast, easy installation.

Description: Manufactured in three sizes —125,000, 175,000 and 225,000 maximum Btu inputs. Made of cast iron, the burner contains a deep, narrow, circular, slotted gas port around which the flame burns completely and evenly. Automatic pilot lighting is obtained by means of a non-cycling electric pilot igniter. The housing, which is made of cold-rolled steel, is finished in baked green crinkle lacquer that is resistant to both heat and chipping. The amount of air admitted into the housing is controlled by a manually-adjusted air shutter vertically inset in the front

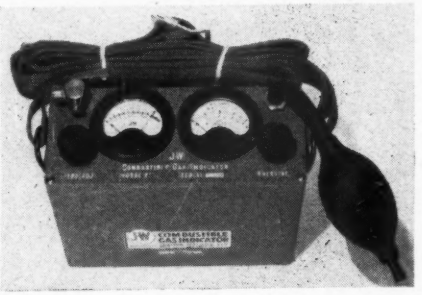
housing. The baffle is made in two sizes so that it will slide through any conventional firedoor, and threaded legs are provided at the front of the unit for quick leveling.

Combustible Gas Indicator

Johnson-Williams, Ltd., Palo Alto, Calif.

Model: J-W Combustible Gas Indicator.

Application: This portable instrument detects and measures any combustible gas or vapor, telling how near the gas mixture is to being explosive. It can be used to test tanks, drums, manholes, or other confined spaces; to check cleaning and ventilating operations; or



to locate leaks in piping systems.

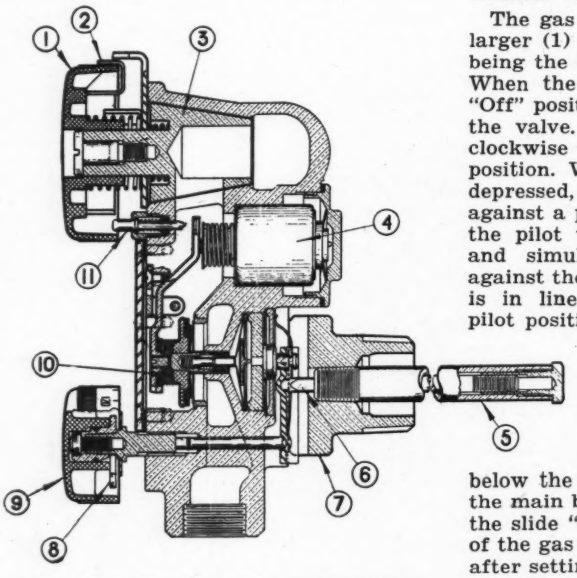
Description: The aluminum case instrument weighs 6¼ lb. and measures 3¼ x 7¾ x 6 in. All combustible gases and vapors are indicated on one scale in units common to all. Flame arresting system prevents flashbacks. To make a test, the suspected vapor is drawn into the indicator by means of the rubber bulb, and the indicator meter responds immediately. A full scale reading indicates an explosive mixture.

Temperature Control

Grayson Heat Control, Ltd., Lynwood, Calif.

Model: Unitrol "A".

Application: The new Unitrol Model "A" is a compact safety and temperature control for water heaters of 20 to 75 gals. capacity. It is especially adaptable to modern types of water heaters of concealed or semi-concealed construction.



The Unitrol "A" can be used with all gases, controls water temperature between 40° and 160° F, provides 100% safety shut-off and safe lighting, filters gas ahead of the pilot valve, incorporates the "A", "B", and "C" valves into one unit, provides front accessibility to all adjustments and facilitates installation and service.

Description: The temperature-sensitive element is the copper-invar tube (5) and rod (6). This assembly is attached to the tank adapter (7) and is separable from the valve body. Such two-piece construction makes interchangeability a simple matter, eliminates necessity for draining the tank, and facilitates original installation.

The gas cock (3) is operated by the larger (1) of the two dials, the smaller being the temperature setting dial (9). When the gas cock (3) is set in the "Off" position no gas can flow through the valve. Rotating the dial (1) 90° clockwise will place it in the "pilot" position. When the dial (1) is manually depressed, a cam on the dial is pushed against a pin (11) which in turn opens the pilot valve, main gas valve (10), and simultaneously sets the keeper against the electromagnet (4). The cam is in line with the pin only in the pilot position.

The filter is located at the top of the valve body on the right side. The pilot gas rate is adjusted by the metering screw on the right side of the valve below the filter. The gas rate flow to the main burner is adjusted by moving the slide "On" stop (2), on the dial (1) of the gas cock (3), to the stop position after setting the dial (1) for the proper gas rate.

Calibration is accomplished by removing the temperature dial (9) from the shaft and changing the position of the calibration disc (8).

Continental

WATER HEATERS ARE EQUIPPED WITH DOMESTIC CONTROLS...

Domestic Model HT-1 S
Supplied to
Continental Water Heater Co.
Los Angeles, Cal.

Many leading water heater manufacturers rely on Domestic Thermostats and Pilots to assure the safe, efficient performance of their heaters.

DOMESTIC THERMOSTAT COMPANY
156 West Pico Boulevard, Los Angeles 15

Domestic
WATER HEATER THERMOSTATS
AND AUTOMATIC PILOTS

WE SELL ONLY TO MANUFACTURERS OF A.G.A. APPROVED WATER HEATERS

LACLEDE TRAINS GAS APPLIANCE DEALERS

By BERT R. MERRILL

LACLEDE Gas Light Co. of St. Louis is one of those far-seeing utilities who believe that the biggest job ahead in appliance promotion and load building is "re-training dealer salesmen to sell." Therefore, in launching a new comprehensive sales training program for 1946, the sales office, headed by R. J. Vandagriff, undertook the largest dealer-cooperation sales education campaign in its history.

All elements of the program are predicated on the unquestionable fact that salesmen in the current seller's market have largely forgotten how to sell, according to Laclede.

"It is difficult to find words to describe fully and adequately the importance of this program," sales representatives have said. "We are confident that its worth will be demonstrated many times over when hard competitive selling confronts all of us again. Looking backward, we can easily understand why salesmen are in need of re-training. For the past four years, gas appliance dealers and their sales crews have been doing a quite different type of selling job—in many cases, *unselling* prospects on nonavailable merchandise, and in others, taking the line of least resistance in disposing of scarce merchandise. Appliance men have not been using the tools needed to actuate decision and impel action by the prospect, and as a result, have become rusty and sluggish."

Laclede's sales office actually got under way on this program over a year ago, in August, 1945, when generally slack salesmanship became a matter of general alarm. Coincidentally with the lothness of salesmen to work at their profession came a series of surveys which indicated an all-time record gas appliance market in St. Louis.

Surveys made during the period when no appliances were available indicated that of the 206,800 families in St. Louis who use gas for cooking, 60% or more were operating ranges more than 10 years old—a wide open replacement market of 124,080 gas ranges. This information stimulated Laclede to use billboards, window displays, and other promotion to build up desire for automatic, economical, and modern gas ranges. Similarly, a survey made with Servel, Inc., in 1944, revealed that 12% of St. Louis homeowners preferred gas refrigeration. On the basis of this telephone querying, the sales office determined that there were at least 19,000 families who wanted gas refrigerators, and probably 25,000 "sell-able" prospects available to dealers. Still further survey work revealed that only 16% of the cities' water heaters were automatic types, and that gas was undeniably in the top spot for future heating installations.

L. C. DeMoss opens first class for Lammert, Stix-Baer-Fuller salesmen.

14 Booklets

Armed with these facts, R. J. Vandagriff and L. C. DeMoss of the sales office spent six months on the preparation of a concise gas appliance sales training program which wastes no time on generalities. For 244 gas appliance dealers in St. Louis, Laclede has produced a swiftly-moving, easily-comprehended training program which consists of 14 bound booklets.

The booklets run from 25 to 40 pages each, and were written from a dozen sources of sales training information. Actually, Laclede kept in mind the fact that many of the salesmen who will use the program are ex-GI's —therefore, the series of booklets is so well worked out that a novice can find every question on salesmanship answered and carefully delineated.

Complete sets of the 14 units have gone to every gas appliance salesman in St. Louis, being released first to the dealer, with instructions not to unleash the entire series at once. Operating its own sales training classes, Laclede recommends that dealers hold their own meetings as well, taking up one booklet at a time. Opening gun of the campaign was introduction of the program and booklets to salesmen of Stix Baer & Fuller and Lammert Furniture Co., in June. These two, largest appliance dealerships in St. Louis, received the plan with enthusiasm, and are already operating on it.

The titles in the series are:

1. Gas information manual for salesmen
2. Science and the art of successful selling
3. What makes people buy gas appliances
4. The salesman and the sale
5. When customers call
6. Prospecting from inside the store
7. Getting business outside the store
8. The development and use of a prospect file
9. Preparing to make an effective sales presentation
10. Making an effective gas range presentation
11. Making an effective gas refrigerator presentation
12. Types and traits of prospects
13. Making a water heater demonstration
14. Making an effective house heating presentation

The salesman who reads one booklet at a time, answering a "quiz" of 10 questions bound into the back, can find all the information normally covered at sales meetings.

Unable to handle all proposed dealer sales meetings on the schedule, Laclede's range and refrigerator sales office is completing arrangements with Arnold Zopf, head of the Division of Distributive Education of the St. Louis Board of Education, to take over teaching its "back to selling" tenets in scheduled meetings. There will probably be one such supervised meeting for dealers and their men each month. Beyond these get-togethers, Laclede is urging dealers to set up their own training program around the manuals —in all cases taking them up one at a time. Response from the 254 dealers concerned, who employ anywhere from one to 20 salesmen, has been excellent.

SEND FOR THIS BOOK... *it's FREE to You*

YOU'LL want this book! It's the only one of its kind. Prepared by Minneapolis-Honeywell with the assistance of F. W. Hutchinson, nationally recognized authority on panel heating and Honeywell consultant, this manual clearly, concisely, and completely covers the theory and application of automatic radiant panel heating controls. The material in the book is based upon the results of several years of research and tests in homes, commercial buildings and institutions.

Here's a book you will want to study for complete, up-to-the-minute information — then keep for permanent reference. It's a contribution to the heating industry by Honeywell, and is offered free to you. Mail the coupon today.

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
2641 Fourth Avenue South, Minneapolis 8, Minn.

Please send my free copy of "Automatic Control of Radiant Panel Heating"

Name_____

Address_____

City_____ State_____

End-Use Control Would Lead to Full Federal Rule, Texas Association Told

CONTINUED and vigorous opposition to any attempt on the part of the Federal Power Commission to assume control over the production and gathering of natural gas was voiced by speakers addressing the annual meeting of the Texas Mid-Continent Oil and Gas Association in Houston, Oct. 17 and 18. While most of the discussion during the meeting centered about the specific problems of oil, questions of natural gas field prices and federal control were taken into consideration.

Clint Small of Austin warned his listeners that if the Federal Power Commission is permitted to assume control over the end use of gas, such a step would be a forerunner of complete governmental control of the whole oil and gas industry.

In his address to the membership, Fred W. Shield of San Antonio, president of the Association, predicted the possible necessity of the oil industry's presenting recommendations to supplement or replace those that might be made by the FPC in future appeals to Congress.

Russell B. Brown, general counsel of the Independent Petroleum Association of America, scouted the theory that the country is running out of oil. "Instead of running out of oil," he said, "we are running into confused thinking by those who do not understand our problems." He also discounted the implication that the United States is without an oil policy. He summarized elements of state and national administrative progress which, without being designated such, in reality constitute such a national policy.

Two Houston oil and gas men, Col. George A. Hill, Jr., and T. E. Swigart, were honored by the presentation of plaques for outstanding contributions to the petroleum industry during the past year.

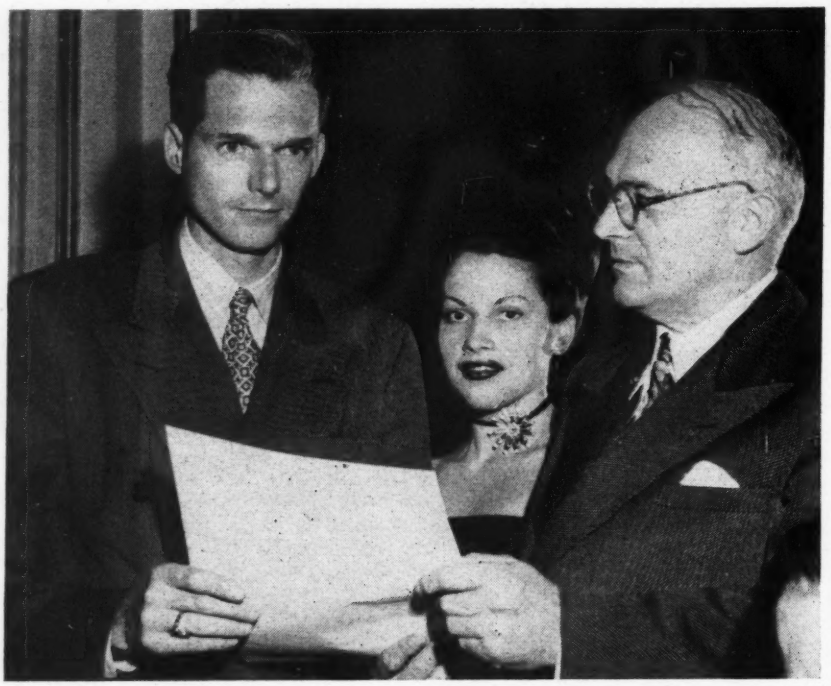
In the business session held the first day of the convention, the members re-elected all their officers for another year.

Brand Names Honors "Wedgewood"

Sixty-four years of public acceptance of the name "Wedgewood," used by James Graham Manufacturing Co., was recognized at a testimonial dinner at the Palace hotel in San Francisco held jointly by the Advertising Association of the West and the Brand Names Foundation. Jim Graham, sales manager of the company, received a certificate of public service at the dinner which was attended by business and industrial leaders and newspaper, magazine, radio and advertising executives, as well as the San Francisco and Oakland advertising clubs.

The certificate of public service, which Jim Graham is shown receiving from Don Belding of the Advertising Association of the West, was given to honor qualified brand names which are native to the 11 Pacific coast and Rocky Mountain states, British Columbia and Hawaii, and which have been maintained for more than 50 years.

The Wedgewood range, first product of the company formed in 1882 by Jim Graham's grandfather, was the only range to be thus honored.



Tours Feature Midwest Council's Fall Meeting

Presentation of addresses and inspection tours of industrial and commercial installations highlighted the fall meeting of the Midwest Industrial Gas Council, held Sept. 12 and 13 at the Radisson Hotel, Minneapolis, Minn.

E. D. Milener, co-ordinator of general research, A.G.A., presented a paper on "Industrial Gas Progress Through Research." R. F. Calrow and Jean Harrison, director and consultant, respectively, of the kitchen planning department, Minneapolis Gas Light Co., discussed the topic, "The Gas Industry Has Added Something New."

A number of industrial and commercial installations were visited on the second day, which was climaxed with luncheon at Minneapolis-Honeywell Regulator Co.'s new cafeteria and a conducted tour through the plant.

Nov. 22 in Fort Worth INGAA to Hold Conference

John A. Ferguson, executive director of the Independent Natural Gas Association of America, has announced that the Arrangements Committee, headed by Joseph E. Bowes, president of the Oklahoma Natural Gas Co., Tulsa, is planning a program of interest and value for members of the industry who attend the annual meeting of the association at the Blackstone Hotel, Fort Worth, Texas, on Nov. 22.

One of the committee's aims is to bring conventioneers up to date on the Federal Power Commission's investigation of the industry. In addition to presentation of papers by industry leaders, seven members of the board of directors will be elected to fill terms which expire this year. The new board will then elect officers for the coming year.

Canadian Gas Now Used In Making Fertilizers Instead Of Explosives

MANY a farmer in Greece undoubtedly would be surprised if he were told that the success of his crops depended to a great extent on natural gas from the Canadian province of Alberta. Farmers in a good many other parts of the world are likewise dependent on this source.

In 1940, the Canadian government erected a plant at Calgary, Alberta, to process natural gas and extract from it nitrates needed in the manufacture of explosives. The Calgary factory ran at capacity for three years producing nitrates until Canadian scientists developed the super-explosive R-D-X, when the factory was no longer needed for war purposes.

Conversion

However, the plant was converted successfully into a producer of materials valuable in peacetime industry, among them chemical fertilizers for agriculture. Substantial quantities of these are being shipped to Greece and other countries of Europe devastated by the war.

The plant was constructed in a hurry in 1940 at a cost of $10 million when it looked as though the Luftwaffe might cripple Britain's great chemical industry. Canada's Consolidated Mining and Smelting Co. operated the plant for the government and when it was no longer needed for war purposes the company renamed the plant Alberta Nitrogen Products.

Problems and Solutions

Conversion of the plant posed difficult problems, among them how to make nitrates in free-flowing crystals small enough to pass through seed drills. To manufacture uniformly small crystalline nitrate, the company engineers and research men evolved a process similar to that used in manufacturing gunshot.

Super-saturated nitrate liquor was allowed to drip through sieves from considerable height. The droplets solidified on the way down. Then, to prevent their caking together, they were dusted with silica powder. The finished product filled the bill within the cost limitations.

Operating at capacity, with a staff of 400 persons, the plant turns out 185 tons of fertilizer and 250 tons of ammonia a day. Consolidated officials say they have assurances of a market for all they can produce for a long time.

Good Load

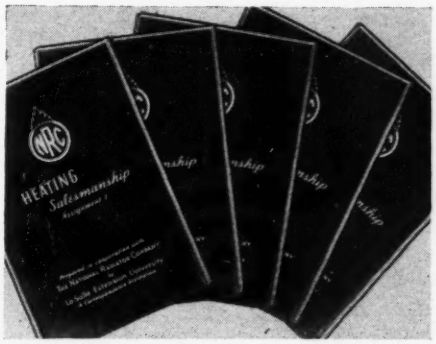
Ironically, farmers in Canada's so-called prairie provinces — Alberta, Saskatchewan and Manitoba — need little of the fertilizer turned out by the plant. This type of fertilizer is not suitable for their wheat lands. Root, vegetable and cane crops thrive on it but grain doesn't.

Natural gas, the basic ingredient in these nitrogen products, is obtained from Alberta's Turney Valley fields. Daily consumption of the plant is 30% higher than the total amount consumed by all other Calgary industrial and domestic users combined.

The newly married Mr. and Mrs. Robert Kelsey receive from John Nelson the first Servel gas refrigerator to be given away on the American Broadcasting Company's program "Bride and Groom." Each Monday for 25 weeks on this program, which is heard from coast to coast, a Servel refrigerator is given to the lucky couple chosen as that day's "Bride and Groom."

Heating Salesmen's Extension Course Offered

RECOGNITION of the need for aggressive salesmanship of heating equipment to compete with more "glamorous" types of merchandise for the consumer's dollar has been crystalized in the form of a contractor-dealer course in "Heating Salesmanship," by the National Radiator Co., Johnstown, Pa. The five basic assignments, plus a sixth special assignment on dealer relations aimed at wholesalers and their salesmen is offered through LaSalle Extension University.



National Radiator underwrote the cost of preparing the booklets, which are incorporated into a non-profit course. The five assignments are priced at $12.50, with the dealer relations course costing an extra $4.

The program was presented in August to the company's Heating Division sales personnel as a feature of a general sales meeting held in Johnstown. Presentation of the program was then made to selected audiences of contractor-dealers and wholesalers in key cities by Paul B. Holmes, manager of sales, Heating Division, and P. M. Hutchins, National's manager of advertising and sales promotion. These meetings are being followed by regional "field" meetings to be held by NRC Heating Division Branch Managers and their selling staffs. The entire training presentation has been reduced to a specially prepared filmstrip and accompanying narration.

Training is started by an application for enrollment, sent directly to the Sales Training Department of National Radiator, or given to a Heating Division sales representative. The actual training will be sent to the enrollee from the university at Chicago.

Hugoton Reserves Estimated

TESTIFYING before the Federal Power Commission for the Michigan-Wisconsin Pipe Line Co. hearing of the firm's application to build an $84 million line from the Texas-Oklahoma portion of the Hugoton field to Michigan, Wisconsin and Iowa, Ralph Davis, geologist for Phillips Petroleum Co., estimated gas reserves in the Hugoton field of Kansas, Oklahoma and Texas at between 20 and 25 trillion cu. ft. Davis estimated that the Hugoton reserves in Texas alone exceed 5 trillion cu. ft.

CURRENT READING

Uncatalyzed Reaction of Natural Gas and Steam—A. S. Gordon. "Industrial and Engineering Chemistry," July, 1946, pp. 718-720. The uncatalyzed reaction of natural gas with steam has been studied between 1225° and 1516°C. with steam-natural gas ratios of 1.5 and 5, and time of contact between 0.21 and 416 seconds. Even at high temperatures, long contact times, and steam-natural gas ratio of 5 there is some carbonization of the natural gas. The extent of carbonization is shown to be a function of the ratio of steam to natural gas, and to vary erratically with temperature and time of contact.

As the temperature is increased, the percentages of natural gas undecomposed in one pass through the furnace become less dependent upon contact time (in the range of contact times studied), until at about 1500°C. there is little or no effect. At any temperature the percentage of undecomposed gas shows little if any dependence on the ratio of steam to natural gas.

Design Plan of United's New Carthage Plant; 170,000 Gallons of Liquid Products Per Day—G. Weber. "Oil and Gas Journal," July 20, 1946, pp. 86-89. Processing 150 MMcf of raw gas daily to extract a total of 170,000 gal. of liquid products, is the design plan of the new United Gas Pipe Line Co.'s condensate-natural-gasoline-recovery plant in the Carthage, Texas, gas field. The gas so treated is collected in a gathering system including more than 100 miles of lines serving 81 wells in the field. After processing the gas to remove condensate, 100 MMcf is processed further to recover natural-gasoline components while 50 MMcf passes directly to the low-pressure gas line. The plant is described and illustrated, and a flow sheet is shown.

Oil Shale—America's Fuel Ace in the Hole—"Oil and Gas Journal," Aug. 31, 1946, pp. 68, etc. This article discusses: Oil shale as a possible source of liquid fuels; American oil-shale deposits contain estimated 92 billion bbl. of oil; demonstration plant being built on naval oil shale reserves in Western Colorado; oil shale research laboratory under construction at Laramie, Wyo.; technical problems which must be solved before commercial production; Bureau of Mines program to test German oil-shale processes; five-year plan expected to provide "know-how" for private industry; success of program would contribute to security of United States.

Gas Recovery Systems—D. Rogers, Jr. "Petroleum Engineer," Reference Annual, 1946, pp. 196, etc. Gas recovery systems have been developed to a high degree of efficiency in the Bradford field in Pennsylvania and New York. These systems recover solution gas from separators and stock tanks and supplement the lease fuel. The gas is removed at low pressure or vacuum from vapor-tighe systems which are protected by safety devices. These systems can be operated by automatic controls and when properly designed and installed require very little attention and maintenance expense. Gas recovery is profitable only in areas where natural gas is costly. For maximum efficiency and financial success the installation of such systems should always be preceded by a thorough study of the property, its production, and facilities.

Use of Magnesium for Cathodic Protection of the Katy Pipe Line—P. Hart and O. Osborn. "Petroleum Engineer," Aug., 1946, pp. 136, etc. The highly successful application of magnesium for cathodic protection of the Dow Chemical Co.'s Katy pipe line on the Texas Gulf Coast should be of exceptional interest to the corrosion engineer. Cathodic protection as a weapon in the great battle against corrosion has always been an intriguing subject to all engineers. Now after six years of extensive investigation, magnesium beckons as a new and deadly ammunition for this weapon.

The Katy line is a 4-in. coated line, 82 miles in length, extending inland from the Dow Chemical Co.'s Freeport plant to the Humble Oil and Refining Co.'s Katy plant, 33 miles west of Houston, Texas. This article shows how 96 magnesium anodes installed in 14 groups were employed in obtaining cathodic protection of this line.

Present-Day Hydrogen Manufacturing Processes—R. M. Reed. "Petroleum Refiner," Aug. 1946, pp. 99-108. This paper describes the hydrogen manufacturing processes that are in use on a commercial scale at the present time in this country. These processes include the following: 1. The electrolysis of water; 2. The steam-iron process; 3. The steam-water gas process; 4. The steam-hydrocarbon process; 5. The steam-methanol process; 6. The thermal decomposition of hydrocarbons. The present production of hydrogen in the United States amounts to about 6 billion cu. ft. per month, of which about 3 billion cu. ft. per month are produced and utilized in the manufacture of synthetic ammonia.

Control of Gas-Cap Expansion in North Coles Levee Pressure-Maintenance Report—W. I. Travers, Jr., "Oil and Gas Journal," July 20, 1946, pp. 91, etc. Pressure-maintenance work in a deep California field, including how a combination injection-production well was constructed, trouble with an expanding gas cap and the remedial work done, are discussed in this article. An A.P.I. paper.

Germany Made Acetylene and Carbon Black by Cracking Natural Gas in Electric Arc—E. S. Pettyjohn. "National Petrolem News," Aug. 7, 1946, pp. R-596, etc. Complete details are given of the process developed by the Germans for manufacturing acetylene and carbon black by the thermal cracking of natural gas in an electric arc, using direct current at 7000 volts. The installation described had 15 units ,each consisting of two converters, one in service and one in reserve, and individual rectifying system with voltage booster and power factor control. The cracking took place at high temperatures and normal pressures, with rapid quenching to retard polymerization of the low molecular weight hydrocarbons.

Mean gas temperature for conversion was 1600°C. After cooling by water spray, the gas passed through a trap and cyclone separators to remove the carbon black, and was then water washed, scrubbed with absorption oil, desulfurized and purified. The acetylene was converted by a four-stage process to butadiene for synthetic rubber manufacture.

While the Germans seem to have successfully solved the technical details of electric arc cracking of natural gas to produce carbon black and acetylene, the wartime conditions under which the plant was operated prevent an economic evaluation of the process in competition with practice in this country.

Gas Hydrate Composition and Equilibrium Data—E. M. Frost, Jr., and W. M. Deaton. "Oil and Gas Journal," July 27, 1946, pp. 170, etc. This report presents data on the composition of the gas hydrate molecule of several pure gases and presents pressure-temperature equilibrium data for several pure gases at temperatures below 32°F. The hydrate composition was obtained by direct measurement of the gas and the water resulting from the decomposition of hydrates. The composition also was calculated from the pressure-temperature equilibrium data. The compositions obtained by direct measurement and by calculation are in close agreement.

Reserves and Production of Natural Gas and Natural-Gas Liquids in Texas—P. Olcott. "Oil and Gas Journal," July 13, 1946, pp. 72, 75. Texas leads the nation in gas reserves by a wide margin. Presented in this article are the first published figures on that state which classify natural gas by types of reservoirs, giving a history of discoveries and reserves, including reserves of natural-gas liquids.

Bureau of Standards:

Research Paper RP 1698: Purification and Properties of 29 Paraffin 4 Alkylcyclopentane, 10 Alkylcyclohexane, and 8 Alkylbenzene Hydrocarbons — A. F. Forziati, A. R. Glasgow, Jr., C. B. Willingham, and F. D. Rossini.

Research Paper RP 1698: Engine Tests with Producer Gas — F. A. Middleton and C. S. Bruce.

Safe Practices for Orifice Meter Repair and Operation—D. Attaway. "Petroleum Engineer," Aug. 1946, pp. 47-50. Author discusses: Toxicity of mercury; prevention of poisoning; qualification of workers; tools and equipment; entering the meter house; testing the meter; inspecting or changing orifice plates; placing meter in service; changing charts.

Vigilant Inspection Keeps Unfired Pressure Vessels Safe—W. E. Rossnagel. "Power," July, 1946, pp. 85-87. Look for pits, cracks, defective welds, loose rivets and riveted joints sprung by expansion or rust, the author says. Be sure tank footing will carry the water load before making a hydrostatic-pressure test on an air or gas receiver.

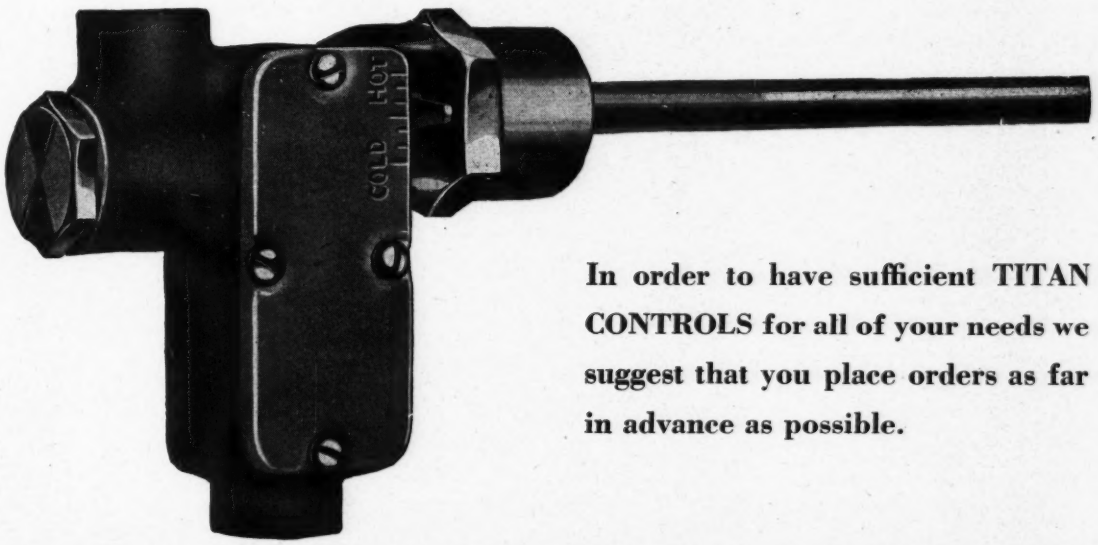
FOR DEPENDABLE SERVICE

Specify... TITAN WATER HEATER CONTROLS

Your reputation largely depends upon the efficient operation of the products which you sell. Therefore the selection of proper equipment for use in those products is of vital importance.

For instance, your customers look to you for trouble-free operation of the Automatic Hot Water Heaters.

For DEPENDABLE service to protect your reputation and guarantee your customers' satisfaction we suggest that your Automatic Hot Water Heaters be equipped with TITAN WATER HEATER CONTROLS.



In order to have sufficient TITAN CONTROLS for all of your needs we suggest that you place orders as far in advance as possible.

THE TITAN VALVE & MANUFACTURING COMPANY

9913 ELK AVENUE • CLEVELAND 8, OHIO

PEOPLE

Henry Fink

• The election of **Henry Fink** as president of the Michigan Consolidated Gas Co., has been announced by **William G. Woolfolk,** chairman of the company. Since last February Fink has been serving as executive vice president. He began his career with the San Antonio Gas, Electric & Traction Co. and has been employed by Michigan Consolidated for the past 27 years. He held a number of positions, becoming superintendent of production, chief engineer, general manager in the Detroit area, and finally head of all the company's properties in Michigan.

Fink is president of the Michigan Gas Association, member of the A.G.A. board of directors, and a member of the Detroit Engineering Society and the American Society of Military Engineers.

• **Frank C. Smith,** president, Houston Natural Gas Corp., Houston, Texas, has announced the resignation of **W. S. Keenan** as manager of the residential and commercial sales department. Keenan will join his son, W. T. Keenan, who has been operating a gas appliance business in Houston since last spring. Keenan's successor at Houston Natural will be **J. F. Amberg,** who served the company in various capacities from 1935 until his induction into the navy. Following four years in the service, he was re-employed last May as assistant to Keenan.

• A new district sales and service office, under the direction of **John E. Anderson,** has been opened at 107 So. Capitol Ave., Indianapolis, Ind., by the Wheelco Instruments Co., Chicago. This office will serve the greater portion of Indiana, western Ohio and Kentucky. It will control a Cincinnati sub-office with **L. A. Wallingford** as district manager. **Walter A. Jones,** service engineer, will assist Anderson in Indianapolis.

H. Lintvedt

• **Halvard Lintvedt** has been appointed general superintendent of Plant Nos. 1 and 2, Ruud Manufacturing Co., Kalamazoo, Mich. Lintvedt is an engineering graduate of the Christiana Technical School, Oslo, Norway, and was at one time a member of the Norwegian air force. In this country he has specialized in the fabrication of Monel and other non-ferrous metals. During the war, he served in an advisory capacity to the army and navy air forces in the design and use of metals for aircraft. Lintvedt was recently general superintendent of the Ruud plant in Vernon, Calif.

• The board of directors of United Engineers & Constructors, Inc., has announced the election of **Carl A. Schlegel** to the position of vice president and gas sales manager. Schlegel joined the United Gas Improvement Co., Philadelphia, in 1910, was transferred to the Northern Indiana Gas & Electric Co., South Bend, Ind., and after World War I returned to United Gas Improvement. In 1928 United Engineers & Constructors, Inc. was formed, and Schlegel became sales manager of the gas division. He is an active member of a number of gas associations.

• The Central Arizona Light and Power Co., Phoenix, Ariz., has announced the resignation of **Edward H. Coe** as president, and the election of **Henry B. Sargent** as his successor. The board of directors elected Coe chairman of the executive committee of the board and general consultant to the company. He has been associated with the Phoenix utility for 22 years. Sargent joined the company last March as executive vice president. He was formerly vice president and general manager of the Mississippi Power and Light Co., Jackson, Miss.

Edward H. Coe

Henry B. Sargent

• **George J. Papas** has been appointed general manager of purchases for Rheem Manufacturing Co., according to a recent announcement by **W. E. Curran,** vice president. Papas will make his headquarters in New York and will direct purchasing for the company's 11 plants in the United States.

• **Frank MacMillen,** New York newspaper man, has joined the staff of the American Standards Association, New York City, as director of information. The announcement was made by **P. G. Agnew,** vice president and secretary of the association.

• **Walter C. Beckjord,** president, Cincinnati Gas & Electric Co., has been appointed by the U.S. Navy Department to serve on the Naval Reserve Advisory Council, which will coordinate the naval reserve program in Greater Cincinnati.

J. D. Conley

• **A. W. Conley,** executive vice president and general manager, Coroaire Heater Corp., has announced the appointment of **John D. Conley** as vice president. J. D. Conley has been a director and assistant secretary of Coroaire since the organization of the corporation. He will supervise the engineering and service departments. At one time he was plant superintendent of the Butler Manufacturing Co., and he has had many years of experience in both production and sales.

• The Fluor Corp., Ltd., has announced the resignation of **Milton Lewis,** vice president, effective as of Oct. 1, 1946.

W. Earl Dunn, vice president who has been in charge of the Kansas City office since 1930, has been promoted to the position of general manager, effective Oct. 1. Dunn is now making his headquarters in the Los Angeles office. **James P. Wiseman,** former district engineer in Fluor's Houston office, is now general sales manager and is located in the Los Angeles office.

• **George W. Bean,** A.G.A. fuel consultant for 15 years, has resigned to engage in individual representation work in Washington, D.C. He will be available for specific retention by any utility. The Washington office of the A.G.A. was closed as of Oct. 1, although a telephone is being maintained in the association's name through arrangement with the Washington Gas Light Co.

• **A. J. Komich,** who was recently discharged from the navy, has been appointed to the New England sales staff of the Pittsburgh Equitable Meter Division, Rockwell Manufacturing Co. He will work from the Boston, Mass., office under the direction of **F. C. Arens,** district manager. Prior to the war, Komich was associated with Worthington Pump and Machinery Co.

G. P. Eichelsbach

• **George P. Eichelsbach, Jr.,** who began with the American Stove Co.'s St. Louis plant in 1935 as an engineering draftsman and later became chief engineer of the St. Louis division and chief engineer of the entire company, has been elevated to the directorship of manufacturing and engineering by the board of directors. **President Arthur Stockstrom,** in announcing the appointment, stated that few engineers have risen to a comparable position in such a short time. In 11 years Eichelsbach has advanced until he now has full responsibility for both manufacturing and engineering in all five plants of the American Stove Co., with headquarters at Cleveland, Ohio.

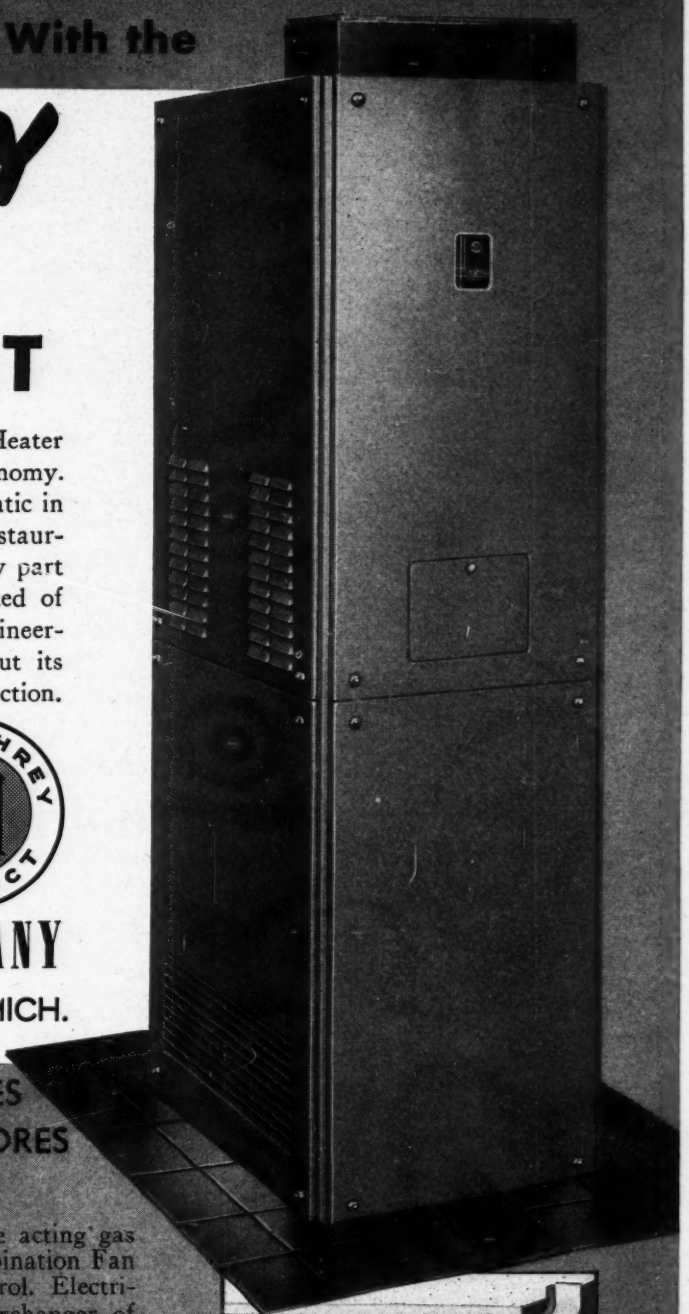
NEW COMFORT FOR THOUSANDS . . . .
NEW PROFITS FOR YOU . . . With the

HUMPHREY
NO. 75
HEAT CABINET

THIS new, smartly styled, gas burning, Forced Air Heater provides the maximum in comfort and heating economy. Modest in price, easy to install and completely automatic in operation, it is ideal for heating homes, shops, stores, restaurants, beauty parlors and countless other places. Every part of the Humphrey Heat Cabinet is sturdily constructed of best quality materials. Skilled designing, advanced engineering and careful workmanship are reflected throughout its entire assembly. It is built to give years of heating satisfaction.

A powerful, blower-type fan, statically and dynamically balanced, delivers an abundance of filtered, humidified, circulated warm air to every point needing heat.

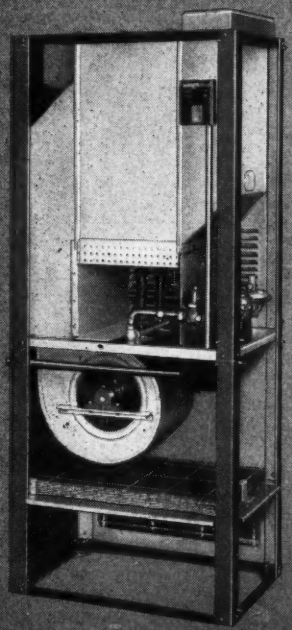
A HUMPHREY H PRODUCT



GENERAL GAS LIGHT COMPANY

202 NO. PARK STREET, KALAMAZOO 11, MICH.

THESE FEATURES MEAN NEW SALES
TO HOMES • SHOPS • OFFICES • STORES



Simple, positive acting gas controls. Combination Fan and Limit Control. Electrically welded heat exchanger of heavy gauge steel. Precision built burner with exclusive Humphrey micro-adjustment air shutters. Oil impregnated filter cartridge of "throwaway" type.

75,000 B.T.U. per hour input rating. Rugged ¼ horse power, capacitor type motor. Humidifier with specially processed ceramic evaporating units located directly in the warm air stream. Slender, compact, handsomely finished cabinet. Every part easily accessible for servicing.

PEOPLE

• **Lee W. Rasch,** at a recent board of directors meeting, was elected vice president of Security Manufacturing Co., Kansas City, Mo. He will be in complete charge of production, engineering and purchasing. Rasch was formerly connected with The American Gas Products Corp. and later with the American Radiator and Standard Sanitary Corp. of New York. He joined the Security staff in 1940 as chief engineer, in which capacity he served until 1943. He served 2½ years in the navy.

Lee W. Rasch

• **D. D. Couch,** vice president, general manager of sales, has announced several changes in general sales supervision of The American Radiator and Standard Sanitary Corp., Pittsburgh, Pa. District sales divisions were discontinued Oct. 1, and all sales territories now function under direct supervision of the general sales office at Pittsburgh. Field managers appointed to coordinate the work of the sales offices are: **A. M. Maddock, H. F. Beglen, H. H. Steck, D. J. Quinn** and **H. C. Day.**

W. T. Reed has been appointed manager of the Philadelphia sales office, succeeding Quinn, and **Thomas Hannah** will assume Reed's duties in the Washington sales office. Day will be succeeded by **D. J. Keefe** as manager of the Buffalo sales office. **Joseph Salamone** is the new manager of the general sales department and quotation department at Pittsburgh.

• Two persons have been added to the sales organization and one sales representative has been transferred to another territory, according to an announcement by **D. S. Sharp,** assistant sales manager, Tappan Stove Co., Mansfield, Ohio.

John V. Burns, a World War II veteran, has been assigned as Western Ohio sales representative and **Howard A. Reaney** has been named associate branch manager of the Los Angeles office. Reaney replaces **R. James Swallen,** who was transferred to the Kentucky-Tennessee territory.

• **Dr. Courtney C. Brown,** head of the Petroleum Economics Division of the Standard Oil Co. (N.J.), has been appointed vice president of the World Trade Foundation of America, it has been announced by **George H. Thornley,** World Trade president. Dr. Brown will serve as consultant for research activities.

• **R. Earl Fisher,** vice president of the Pacific Gas & Electric Co., San Francisco, has been appointed Northern California chairman of the Committee for Economic Development. The announcement was recently made in New York by **Walter Fuller,** CED chairman.

• **George D. Wilkinson,** president of Cribben & Sexton Co., Chicago, recently was appointed one of the co-chairmen of the Industrial Division of the 1946 fund appeal for the Sister Elizabeth Kenny Foundation. The appointment was announced by **Kate Smith,** national chairman, and **Bing Crosby,** chairman of the executive committee.

• **G. S. Dawson** has been appointed superintendent of gas engineering by the B. C. Electric Railway Co., Vancouver, B.C. Dawson will advise on all gas construction and distribution plans, a program which will involve expenditure of over $2 million during the next 18 months. He was formerly gas sales manager for the company.

• Election of **Abijah U. Fox** as chairman of the board of directors of the Mathieson Alkali Works has been announced by **George W. Dolan,** president. Fox recently returned from Europe where he served as Deputy Director, Finance Division, U. S. Military Government, Germany.

• **Loan W. Richardson** on Sept. 1 was named superintendent of the Gas Service Co. of Kansas City, Mo., at Independence. Richardson's territory includes the entire Independence and Inter-City districts. Recently he was general superintendent of the Missouri Public Service Co., Warrensburg, Mo.

• **The American Coach & Body Co.,** Cleveland, Ohio, has established operations in California with a plant at 432 Fifth St., Oakland, Calif. **Fred C. Hall,** who has been with the company for seven years, is the vice president and general manager of the new plant. He has served as a civil and utility engineer in the telephone industry, and operated a steel fabricating company during the war.

Assistant secretary and comptroller is **Andro J. Macho,** who has been with American Coach & Body for 10 years. He served with the U.S. coast guard from 1942 to 1945.

Henry F. Kippe, chief engineer, has been in the truck body business for 26 years with Anheuser & Busch, Roehik Body Co., and Mueck Auto Body Co., all of St. Louis. He joined Curtiss-Wright in 1940 and moved to the Ohio Aircraft Fixture Co. in 1945. Kipp became associated with American Coach & Body this year.

• **Ben W. Bittner** has joined the staff of the industrial division of Bryant Heater Co., Cleveland, Ohio, as sales engineer, according to **D. A. Campbell,** manager of the division. A member of the American Society for Metals, Bittner was previously associated with General Alloys and North American Manufacturing Co. in a sales engineering capacity, and with Crucible Steel Co. as combustion engineer.

War Plant Purchased By American Stove Co.

The American Stove Co., Cleveland, Ohio, has purchased a Cleveland war plant which will add 250,000 ft. of factory and office space for production of heavy cooking equipment, Arthur Stockstrom, president of the firm, has announced. The plant, formerly operated by Ohio Carnkshaft Co., is part of American Stove's $3 million postwar expansion program. Machinery and personnel will begin moving from present quarters about the first of the year.

Other building program developments of the firm include the addition of more than 300,000 sq. ft. of working area to the St. Louis manufacturing plant and construction of a six-story office building.

Flato Interests Buy Chambers Range Corp.

Franklin, Frederick and Robert Flato, partners in the Edwin G. Flato Co., Corpus Christi, Texas, have purchased the Chambers Range Corp., Shelbyville, Ind. John Chambers, former owner and president of the Chambers Corp., will remain with the firm as its executive head. No changes in personnel or sales organization are contemplated.

Carbureting Unit Under Way for Canadian Company

Construction of the new carbureting gas water unit for the B.C. Electric Railway Co., Ltd., at Victoria, B.C., has now passed the half-way mark. The new plant which will be operated by the Victoria Gas Co., a B.C. Electric subsidiary, will cost approximately $200,000.

The unit is being installed by John Inglis Co., Toronto. Contracts for the steel work and foundation construction are being handled by Crowley Construction Co., and Parfitt Bros. The new unit will add 1.5 MMcf output to the Victoria gas supply to give a total output of 2.75 MMcf.

Gas Used in Building Chosen for UN Assembly

The New York City building, selected as headquarters for the General Assembly of the United Nations, will be heated by gas and all of the cooking and service water heating will be gas-fired. Estimated gas consumption for heating the building will be 21 MMcf yearly.

Estimated cooking and water heating load for the restaurant and cafeteria will be between 250 and 300 Mcf per month.

LP-Gas Plant Authorized

The Kentucky Public Service Commission has authorized the Central Kentucky Natural Gas Co. to build a $225,000 liquefied petroleum plant for gas production. The authorization came after the company complained that its natural gas supply is disturbingly low at times and the liquefier would be used to boost supplies.

Sales Office Moved

The Southeastern sales division headquarters of the American Stove Co. have been moved from 252 Peachtree St. to Suite No. 415 in the Candler Bldg., Atlanta, Ga., according to a recent announcement by L. L. Peters, sales manager of that territory.

Peace River, Alberta, Is Most Northerly Gas Outlet

Franchise has been granted to S. Hector of Calgary, Alberta, for supply of natural gas to the town of Peace River, Alberta. Hector has acquired a reservation of 18,000 acres north and east of Peace River and is drilling three gas wells, one mile north, two miles north, and three miles northeast respectively.

Gas was discovered in Peace River in 1916. In the following nine years a score of wells was drilled, with depths ranging from 300 to 3000 ft. Recently the town of Athabasca, 75 miles northeast of Edmonton, announced the granting of gas franchise. Now Peace River, 250 miles north and west of Edmonton, becomes the most northerly gas outpost in the province.

Portland Gas & Coke Sponsors Canning Schools

Portland Gas & Coke Co., Portland, Ore., co-sponsored a series of free cooking and canning schools in Hillsboro, Salem, Corvallis, Vancouver and Oregon City, Ore. Other sponsors were the Amalgamated Sugar Co. and Kerr Mason Jar Co. Vivian Freeman, Kerr's home canning authority, served as instructor, assisted by Rita Calhoun and Lois Heesacker of the gas company. In connection with the classes, gas appliance dealers in Oregon City offered 64 prizes valued at more than $650, including a CP gas range and three automatic gas water heaters.

Propane Storage Project Under Way By CG&E

Foundations are now being constructed for a $300,000 propane storage project which will increase supplies of gas available from Cincinnati Gas & Electric Co., Cincinnati, Ohio. Fifteen 25,000-gal. storage tanks with a total capacity of 35 MMcf of 1000-Btu gas will be installed, according to Milton J. Pfeiffer, manager of gas production. Each tank will measure 8 ft. 7 in. in diameter by 66 ft. in length.

The expansion program is expected to be completed by the end of this year.

Taylor Brothers Receives Housing Unit Contract

Gas has been chosen for space heating, cooking and water heating in all 750 units of a new veterans' housing project in Pittsburgh. Taylor Brothers Co., 942 Penn Ave., has been awarded a contract for 750 Temco gas space heaters and 750 A-B 4-burner, apartment-type gas ranges. Taylor Brothers foresees a tremendous market for gas appliances. To provide better display facilities for major appliances, they have installed three complete model kitchens.

Ruud Plans Expansion

Profit figures of Ruud Manufacturing Co., Pittsburgh, Pa., for the past two fiscal years ending June 30, were respectively $145,162 and $114,662 on 100,-123 common shares outstanding. Optimistic as to the future, the firm is constructing a large plant at Kalamazoo, Mich., which will add to its production facilities there, and at Pittsburgh, Pa., Santa Cruz, Calif., and Toronto, Canada.

For PROFIT, PROTECTION And Better Small City GAS PLANT PERFORMANCE

For more uniform operating performance, with more profit and greater protection against unsteady or inadequate supply during emergencies and peak load demand, convert that small city gas plant to Liquefied Petroleum Gas.

Warren has pioneered in Butane and Propane for 25 years. Our greatly increased production, storage and transportation facilities are adequate to meet your needs. Our engineering advice and consulting service are available to you without obligation.

Why not discuss the many advantages of Liquefied Petroleum Gas conversion of small city gas plants? Their automatic operation, low conversion costs, reduced labor, fuel and maintenance costs mean better performance, greater protection and more profit. Contact your nearest Warren office today. Arrange to enjoy these benefits tomorrow.

WARREN PETROLEUM CORPORATION
TULSA, OKLAHOMA
Detroit Mobile Houston

E. HOLLEY POE & ASSOCIATES
SEVENTY PINE STREET
NEW YORK 5, N. Y.
NATURAL GAS CONSULTANTS

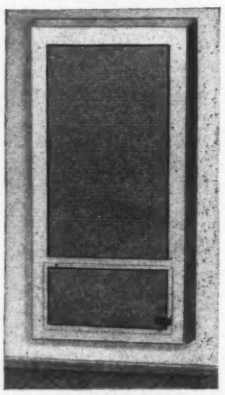
An Educational Prize-Package!

The "Service of Selling" Series of Sales Training Texts

On all sides, merchandisers are busy preparing for the highly competitive days to come. Sales training programs are a MUST with all alert organizations. Many are developing their programs around the newly-published "Service of Selling" salesman training books which were expressly written to promote appliance selling. You can't afford to delay. Order now. Set of 3 volumes, clothbound, only $4.

The Cleveland Heater Co.
2310 Superior Avenue
Cleveland 14, Ohio

WILLIAMS VENTED WALL WARMOLATOR
for New Residences.
For Butane, Propane or Natural Gas



Dual type. 45,000 B.T.U. input. Color, light ivory. For 2x4 studs.
Automatic temperature control with Wall Thermostat or for manual control with pilot lighter.
Easily installed—Easily accessible.
No pit or basement. Approved by A.G.A.
Eligible for F.H.A. loans.
Size of face 25¼" wide, 50" high
Size of recess in walls, 23¾" x 48" high. Projects from wall, 4 inches.
Ask for Circular, Form 211.

WILLIAMS RADIATOR CO.
"Sponsors of better heating since 1916"
Sales Office:
3115 Beverly Blvd., Los Angeles 4, Calif.
Factory: 1821 Flower Street, Glendale 1, Calif.

PIPE LINE NEWS

• **Eastern Indiana Gas Co.,** Indianapolis, Ind., has asked the FPC for permission to extend its facilities to near Muncie, Ind., to receive additional gas from **Panhandle Eastern Pipe Line Co.'s** 18-in. line across north-central Indiana. In addition, Eastern Indiana asked the commission to direct Panhandle to make the connection and furnish gas for distribution in Wayne, Rush and Henry counties. Facilities requested by Eastern Indiana include about 23 miles of 3-in. line connecting with Panhandle's 18-in. line near Muncie. Estimated cost is $83,812.

As an alternate to the construction requested, the firm proposed that the commission determine that **Indiana Gas and Water Co.** of Indianapolis is a "natural gas company," and then direct Indiana Gas and Water to deliver gas to Eastern Indiana Gas Co. at Newcastle, Ind.

• **Montana-Dakota Utilities Co.,** Minneapolis, Minn., has received FPC authorization to construct and operate 28½ miles of 10¾-in. gas transmission pipe line in Valley county, Montana, at an estimated cost of $280,000. The proposed line, the company stated, will parallel an existing 8-in. line and will transport additional natural gas for distribution in communities now served by the company, and transport gas during summer and off-peak periods for repressuring and storing.

• **Lone Star Gas Co.** has installed 2600 ft. of 2-in. pressure gas mains in the Lake View district, San Angelo, Texas, to make available domestic gas for homesteads of the area, Paul H. Adams, plant engineer, has announced. This is part of a general expansion program which is being pushed to completion. Immediate service to 26 homes has been made available, and a greater number of consumer outlets is foreseen in the near future.

• The FPC has received a request from **Panhandle Eastern Pipe Line Co.,** Kansan City, Mo., and Chicago, Ill., for authorization to install eight compressor units aggregating 12,200 hp in eight of the compressor stations along the company's pipe line system, which extends through Texas, Kansas, Missouri, Illlinois, Indiana, Ohio and Michigan. Estimated cost is $2,685,000.

• Douglasville, Bremen, Hampton and Gordon, Ga., all of which have granted franchises to the **Atlanta Gas Light Co.,** are being added to the company's system which now covers Atlanta and 30 other Georgia communities. Atlanta Gas Light has planned a three-year, $6 million expansion program, which will require 70 miles of new gas mains to meet minimum requirements in the company's territory.

• The FPC has authorized **Northern Natural Gas Co.,** Omaha, Nebr., to construct and operate six compressor additions which will increase the company's total pipe line capacity from 300 to 325 MMcf per day, and the capacity into the Minneapolis-St. Paul, Minn., area from 82 to 89.5 MMcf daily. Estimated cost of the facilities is $723,000 to be financed from cash on hand.

• **The Ohio Fuel Gas Co.,** Columbus, Ohio, applied to FPC for authority to install additional facilities and make changes in its existing transmission system for the purpose of receiving additional quantities of gas from **United Fuel Gas Co.** for immediate delivery to customers and for storage in Ohio. Total construction costs were estimated at $3,370,100.

• The FPC has authorized **Mississippi River Fuel Corp.,** St. Louis, to add to its existing pipe line system approximately 265 miles of 22-in. loop line, about 14 miles of 12-in. loop, a 10-in. manifold crossing of the Mississippi river, and to install an aggregate of 10,400 hp of compressor units at its eight compressor stations. Total cost of the facilities was estimated at $11.6 million.

• **The Manufacturers Light and Heat Co.,** Pittsburgh, Pa., anticipates completion of its 20-in. line, running from the West Virginia border to a point west of Pittsburgh near Coraopolis, Pa., Nov. 15 if favorable weather continues and supplies of materials are available. Fifty-four miles of the 20-in. line are to be laid in 1946 and the remaining 22 miles in 1947.

GAS ENGINEER WANTED

Gas Engineer with experience on layout and operation of manufactured gas plants and distribution systems wanted by general gas engineering organization. Reply giving details of age, education and experience.

Box 750, GAS, 1709 W. 8th St.,
Los Angeles 14, Calif.

Houston Natural Resumes "Classroom of the Air"

The "Classroom of the Air" radio program sponsored by Houston Natural Gas Corp. resumed its sessions over station KWBU at Corpus Christi, Texas, on Sept. 30. Miss Aline McKenzie, home economics department head at Texas A & I College, is in charge of the program. Girls from all over Texas participate, and the sound engineers for the broadcast are A & I students, specially trained by KWBU staff men.

Cabot Carbon Buys Plant

Cabot Carbon Co. has purchased the Guymon, Okla., carbon-black plant which it operated during the war, from the War Assets Corp. The plant, purchased for $550,000, has a monthly capacity of 1¼ million lbs. and operates on sweet gas from the Guymon-Hugoton area of Kansas and Oklahoma. Purchase price included 20 houses built by the government for plant employees.

Gas Workers To Have Wage Increase and Welfare Plan

Increase of 10 cents an hour and provision of a contributory welfare scheme will be undertaken by the B.C. Electric Railway Co., Ltd., for 400 workers of the gas division. The workers are members of the Vancouver and Victoria Gas Workers Federal Union 225, and have just completed an agreement with the company.

Eighty of the workers are located in Victoria and 320 in Vancouver. Under the new agreement there will be a contributory welfare plan for medical, surgical and hospital expenses. The plan also calls for the payment of $20 a week sickness or accident indemnity.

The new contract calls for a 10 cent an hour wage increase "across the board," retroactive to May 16, 1946. No broad changes will be made in the 44-hour week, but one small group of workers will have their hours reduced from 48 to 44.

Texas Petroleum Industry Taxes Support Students

The Texas Mid-Continent Oil & Gas Association has reported that the petroleum industry paid through taxation in 1945 a total of $34,205,291 toward support of Texas public schools, a sum estimated to pay the costs for nearly half a million children.

Fred W. Shield, association president, said: "Using the average per capita schooling cost of $75.62 the oil industry paid for the education of 452,331 Texas children, or about one out of three. In addition, more than $8.5 million was paid into the permanent school and university funds for lease exploration rights and royalty payments reserved to those funds."

Article Being Prepared On Arkansas Gas Production

An article on natural gas production in Arkansas is being prepared by "National Georgraphic" magazine, following publication of a recent general article on the state written by Frederic Simpich, assistant editor.

Photographs of gas-fueled kilns of the Camark Pottery Co. at Camden, several installations of the Arkansas Power and Light Co. and production scenes in South Arkansas oil fields and at the plants of the Lion Oil Co., El Dorado, will accompany the story. The Arkansas Resources and Development Commission is assisting in gathering information requested by the magazine.

Niagara Hudson Power Corp. Plans Major Consolidation

Permission for consolidation of its three principal operating subsidiaries, Buffalo Niagara Electric Corp., Central New York Power Corp., and New York Power and Light Corp., into a single electric and gas operating company has been requested from the New York Public Service Commission by Niagara Hudson Power Corp. More than 99% of the common stock of the consolidated company would be owned by Niagara Hudson.

The proposed consolidation must also be approved by the Securities and Exchange Commission.

Back to Normal Line Maintenance

Proper maintenance of distribution mains of a dry-gas system is more necessary than ever. But you don't have to search for materials and manpower to keep your system at high operating efficiency. With "Carboseal" anti-leak your leakage problems can be overcome quickly and easily.

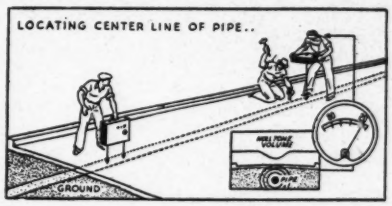
"Carboseal" anti-leak was specifically developed to overcome leakage due to dried-out jute and hemp packing in bell-and-spigot joints. Introduced into gas mains, it penetrates the dried-out packing fibers, causing them to swell and pack the bell tightly—preventing further leakage. "Carboseal" anti-leak is an effective, economical, and long-lasting means for improved maintenance which pays dividends in trouble-free distribution.

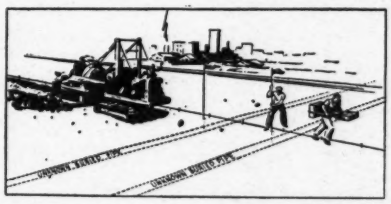
Get all the facts, then decide how "Carboseal" anti-leak can work for you as it has so successfully for hundreds of others. Write for booklet F-4506 which tells how "Carboseal" anti-leak is applied, how much it costs, and what results can be obtained.

CARBIDE AND CARBON CHEMICALS CORPORATION
Unit of Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York 17, N. Y.

CARBOSEAL ANTI-LEAK

"Carboseal" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.





M-SCOPE

Buried Pipe and Cable Finder

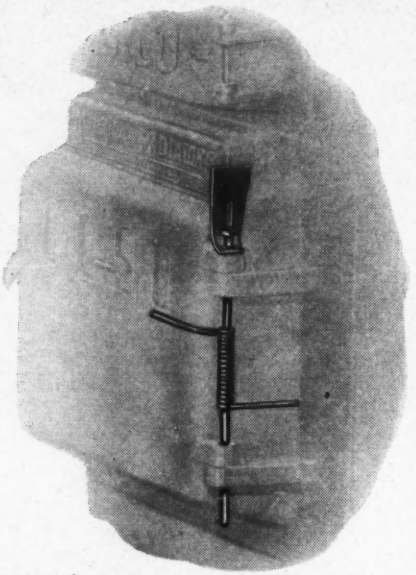
16 PAGE BOOKLET FREE UPON REQUEST

FISHER RESEARCH LABORATORY
Palo Alto, California

The Inland Door Closer

DESIGNED for CONVERSION BURNERS

OVER 50,000 IN USE

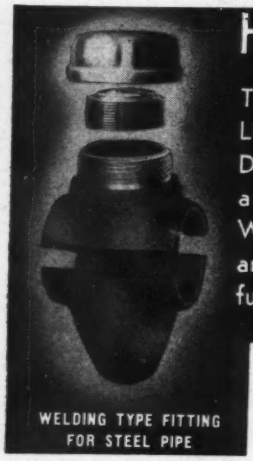


This device, designed for conversion burners, automaticallly closes the fire door of a boiler or furnace when blown open.

It consists of a cadmium plated door hinge pin, spring and wedge. The hinge pin replaces the regular fire door pins, the spring furnishes the motive power and the slotted wedge holds the fire door in the open position when required.

Furnished in 3/16 — 1/4 — 5/16 — 3/8" Sizes

INLAND MANUFACTURING CO.
1120 N. Cicero Avenue, Chicago, Ill.



WELDING TYPE FITTING FOR STEEL PIPE

Have *YOU* tried these yet?

This is one of the Mueller Fittings used with Mueller Line Stopper and Equipment that permit you to make Dead-End Extensions, Lateral Connections, or Isolate a Section of Line and do it in Absolute Safety and Without Irterruption of Service. Learn how speedily and economically you can do this work. Write for full information today.

MUELLER CO.
DECATUR, ILL. LOS ANGELES, CAL.

CONNELLY IRON SPONGE

For Real Gas-purifying Power

● To get top efficiency in gas-purification at the lowest cost, use Connelly Iron Sponge. It's the finest purification material to be had.

Connelly Iron Sponge has a high degree of activity. It gives longer service before fouling. It revivifies more quickly. Leading gas companies have been using this "blue-ribbon" purification material for years—they know it can be relied upon to do the best job.

If you have a problem in gas-purification, take advantage of Connelly's 71 years of experience. Our engineers will be glad to help you . . . there is no obligation. Consult Connelly!

Connelly Valves, Governors, and Manometers are now manufactured and sold only by Norwalk Valve Co., South Norwalk, Connecticut. Connelly will, however, continue to manufacture and sell Gas Purification Equipment including Connelly Iron Sponge, pH Kits, Caloroptics, and BTU Control equipment in connection with propane and butane.

CONNELLY IRON SPONGE & GOVERNOR CO.
Elizabeth, N. J. Los Angeles, Calif.
3154 S. California Ave., Chicago 8, Illinois

American-Standard Issues New "Sales Aid" Booklets

Seven new "Sales Aid" booklets have been issued to wholesale distributors by American Radiator & Standard Sanitary Corp., according to H. L. Spindler, manager of advertising and sales promotion. The booklets, part of a series which will eventually cover the firm's complete line of heating equipment and plumbing fixtures, are presented in a display portfolio. Six pamphlets previously released —five on plumbing fixtures and one on gas boilers—are included in the portfolio.

Five of the new booklets cover Sunbeam heating equipment, giving product information, specifications, and installation data. Full color illustrations emphasize sales features and point out details of construction. Another of the booklets describes "Severn", "Arcoliner", and"Redflash" boilers for coal firing, and the seventh new booklet shows Chromard brass fittings.

The booklets are pocket-sized and may be used as point-of-sale literature or as direct mail pieces. They are available to the trade, properly imprinted, through regular wholesale distributors.

Bendix Laundry Institute Reports Survey Results

The Bendix Home Laundry Institute, South Bend, Ind., has carried on a survey among Bendix users in South Bend, which revealed that 55% of the housewives have two or more washdays a week, and Monday is losing ground as national washday. Forty per cent favor the traditional Monday washings, but Tuesday, Friday and Saturday were each selected by 16%. Only 6% chose Wednesday or Thursday.

The survey also covered drying and ironing practices and revealed that 85% use an electric hand iron, and the average ironing time per week is 4 hours 21 minutes. The approximate time required for each person to hang on a line and remove an average 144 pieces a week is 1 hour 48 minutes.

Linde Air Products Co. Completing Charlotte Plant

Linde Air Products Co., a unit of Union Carbide and Carbon Corp., New York City, has opened a new oxygen filling station and Prest-O-Lite acetylene producing plant in Charlotte, N.C. The oxygen plant is already in operation, and the acetylene plant will start operating by Dec. 1, 1946. The filling station and plant, just outside the Charlotte city limits, are conveniently located for supplying the company's products to industries in the area.

PG&E Enlarges Building

The Pacific Gas & Electric Co. is planning a $2.18 million expansion project, designed to enlarge its general office building in San Francisco. Ten stories will be added to a three-story wing, and a 13-story addition will extend 137½ ft. farther along one side. An old six-story building is being wrecked to make room for the extension.

The enlarged building is expected to meet PG&E's requirements for at least 10 years. The extension will increase the working space 67%.

Medal for Merit Awarded For Portable Pipe Line

On Oct. 7 Sydney S. Smith, manager of the products pipe line department of Shell Oil Co., was presented the Medal for Merit, highest civilian award, "for exceptionally meritorious conduct in the performance of outstanding services to the United States." Col. C. H. Chorpening, Tulsa district engineer, presented the award.

The citation stated that "following the outbreak of World War II, Smith foresaw the entry of our country into the conflict and started to promote portable military pipe lines to keep mobile armies supplied with petroleum products. Actuated by high patriotic motives, he unstintingly gave his time and experience in assisting the government in designing, perfecting and proving such equipment."

Carthage Hydrocol Plant To Use Hidalgo County Gas

Most and possibly all of the natural gas to be used in gasoline conversion at the $19 million Carthage Hydrocol, Inc., plant at Brownsville, Texas, will be supplied by pools in Hidalgo county, Texas. The pools are the South Weslaco, South Mercedes and LaBlanca pools in which La Gloria Corp. of Corpus Christi owns production and the San Salvador pool near Edinburg in which the Gulf States Oil Co. is principal owner and operator.

A total of 64 MMcf from the four pools is expected to be used daily. Fifty-five miles of gas line will transport the fuel.

Permutit Co. Acquires Simplex Valve and Meter

The Permutit Co., New York, N.Y., manufacturer of water conditioning equipment, industrial ion exchangers and power plant specialties, has acquired the Simplex Valve and Meter Co., Philadelphia, according to a recent announcement by H. W. Foulds, Permutit president. Foulds succeeds W. H. Roth as president of the newly-acquired subsidiary, while Roth becomes the Simplex board chairman. The Simplex Co. will continue to operate under its own name.

Cincinnati Gas & Electric Now Independently Owned

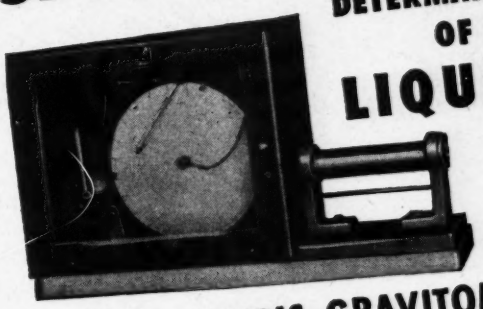
At a recent meeting at the City Bank Farmers Trust Co., New York, Cincinnati Gas & Electric Co. became an independently-owned public utility when the ties which made it a subsidiary of Columbia Gas & Electric Corp. were severed. Columbia Gas & Electric has disposed of its holdings of the common stock of the Cincinnati company, as ordered by the Securities and Exchange Commission.

Liquidation Plan Approved

The SEC has approved an application whereby Cities Service Power & Light Co. will transfer all its assets to its parent, Cities Service Co. The parent will surrender 400,000 common shares of the subsidiary for cancellation and will make a capital donation to Power & Light of $2.7 million to enable it to pay all its liabilities.

ARCCO

SPECIFIC GRAVITY DETERMINATION OF LIQUIDS



ARCCO-ANUBIS GRAVITOMETERS

• This Precision instrument indicates almost instantly and records continuously the Specific Gravity of liquids under actual line pressure. • The record made on the chart is automatically corrected to 60°F or other predetermined temperature. • Foreign liquids and gases are automatically purged. • There are no moving joints, stuffing boxes or other sources of leakage or friction in the Arcco-Anubis Liquid Gravitometer. • Hundreds are in continuous use in pipelines and refineries throughout the country.

Send for Bulletin No. 111-A

AMERICAN RECORDING CHART CO.

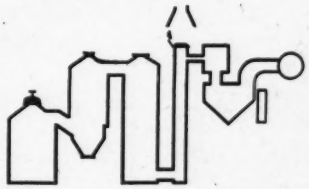
3113 E. 11th Street · Los Angeles 23, California

SEND FOR ARCCO CHART BULLETIN

SEMET-SOLVAY ENGINEERING CORP. WE SELL SOLUTIONS TO HARD PROBLEMS NEW YORK

SEMET-SOLVAY ENGINEERING CORPORATION

40 RECTOR ST., NEW YORK 6, N. Y.



- BLUE GAS PLANTS
- GAS PURIFIERS
- WATER GAS MACHINES
- CONDENSERS
- WASHER COOLERS
- WASTE HEAT BOILERS
- CHARGING MACHINES
- PRODUCER GAS PLANTS

THERMAC

Appliance

REGULATOR

H-M Low Pressure Gas Regulator
Sizes from ⅜ in. to 1½ in.

Max. Inlet Press. 15 in. W.C.
Max. Outlet Press. 5 in. W.C.

1 All Aluminum
2 For Natural Gas, Manufactured Gas or Butane-Propane Air Mix
3 Factory Tested and Sealed to Customer's Desired Setting
4 Low Maintenance
5 Approved by A.G.A.
6 Over a Million in Use

Order Now for early delivery!

THERMAC COMPANY
800 East 108th Street
Los Angeles 2, California

CLIP THIS AND MAIL TODAY

IF YOU ARE NOT A REGULAR SUBSCRIBER TO **GAS**

In GAS each month you will find dozens of ideas that will help you know your business better and do your job better. Just one of these ideas coming to you on our pages can pay you many, many times the small cost of a subscription.

GAS ... 1709 WEST EIGHTH ST.,
LOS ANGELES 14, CALIFORNIA

Please enter my subscription to GAS for ...

1 YEAR $2.00 ☐

☐ Check is enclosed ☐ Please bill me

NAME_____ POSITION_____

COMPANY_____

STREET CITY ZONE STATE

Catalogs

• **Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N.Y.**—A bulletin now available from this firm describes EutecRod 1801, a new low-temperature welding alloy. Applied by the oxyacetylene torch, furnace, or high frequency induction heating equipment, it bonds at base metal temperatures of 940° to 1120° F and melts at 1143° F. Weld deposits are claimed to have a shear strength of 120,000 psi, good corrosion resistance, and good electrical conductivity. Available in rod, wire, strip and powder form for use with Eutector flux 1801.

• **The Fluor Corp., Ltd., 2500 South Atlantic Blvd., Los Angeles 22, Calif.**—This firm has published General Catalog No. 46, available upon request, which contains information on all its manufactured products, plus a description of the engineering and construction services it has to offer. Some of the topics listed in the index are aerator cooling towers, counterflow cooling towers, fin-fan cooling units, organization chart, gas cleaners, mufflers, patented processes, and pulsation dampeners.

• **Worthington Pump and Machinery Corp., Harrison, N.J.**—Three new color bulletins have been announced. Bulletin L-640-B1A describes and profusely illustrates Worthington single horizontal air and gas compressors. Bulletin W-350-B5A discusses Worthite specialties, including valves, pipe, flanges, hose nipples, castings, bars, forgings, wire, welding electrodes and screw machine products. The story of the DH diesel engine—oil, gas, or dual fuel model—is told in 35-page Bulletin S-500-B42A.

• **Eclipse Fuel Engineering Co., 778 S. Main St., Rockford, Ill.**—A new 8-page booklet describes and illustrates the company's line of improved Rotair recirculating air-draw furnaces. They are gas-fired and especially designed for heat treating below 1250° F. High velocity circulation of heat gases in the unit is said to give accurate and uniform temperature control in very dense loads. The booklet covers operating data, sizes and specifications in detail.

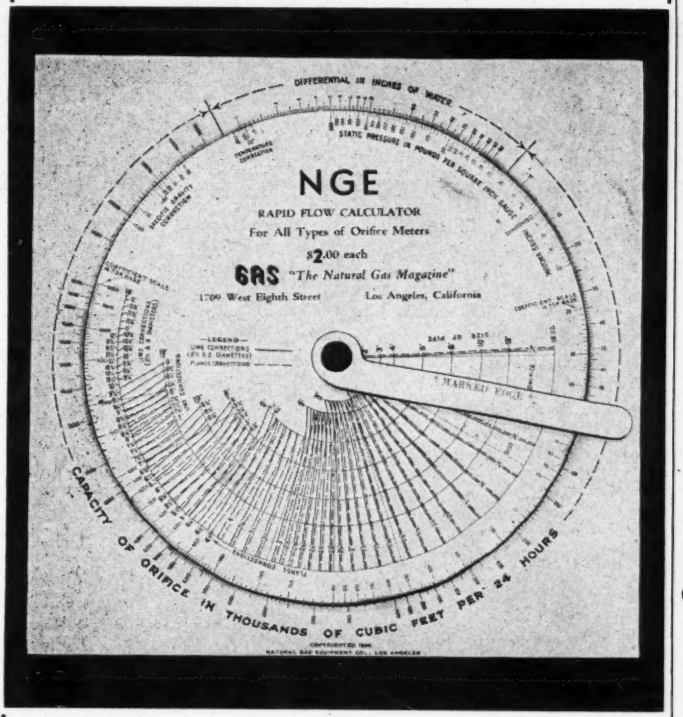
• **Claud S. Gordon Co., 3000 S. Wallace St., Chicago 16, Ill.**—A 4-page color bulletin available from this firm gives complete technical description of Xactline straight line temperature control. According to the company, the instrument provides new standards of accuracy. It holds tolerances as close as 1/5° F, and on-off cycles as short as three seconds have been attained. One model serves all applications.

• **Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa.**—An illustrated and detailed description of Selas systems for batch cooking, bulletin No. 333-F has just been published. It includes sectional and schematic drawings, tables, operating principles, applications, characteristics and advantages of Selas developments in the field of batch cooking by use of the so-called "Duradiant" burner.

NGE RAPID FLOW

CALCULATOR

FROM 2 inches TO 16 inches


NGE
RAPID FLOW CALCULATOR
For All Types of Orifice Meters
$2.00 each
GAS "The Natural Gas Magazine"
1709 West Eighth Street Los Angeles, California
CAPACITY OF ORIFICE IN THOUSANDS OF CUBIC FEET PER 24 HOURS

. . . will quickly compute any of a series of variables in the transmission of natural gases.

SIMPLE to operate: Set dial . . . Turn indicator . . . *and instantly find*

1 COEFFICIENT and VOLUME
2 CORRECT ORIFICE SIZE IN ANY GIVEN VOLUME
3 DIFFERENTIAL PRESSURES

Our NGE CALCULATOR has been tested in field and desk use. Why not let it *help you* with your daily problems. If interested send in coupon and you will receive our calculator in a few days.

GAS
1709 West Eighth Street
Los Angeles 14, California

$2.00 EACH
25% discount on all orders for 25 or more

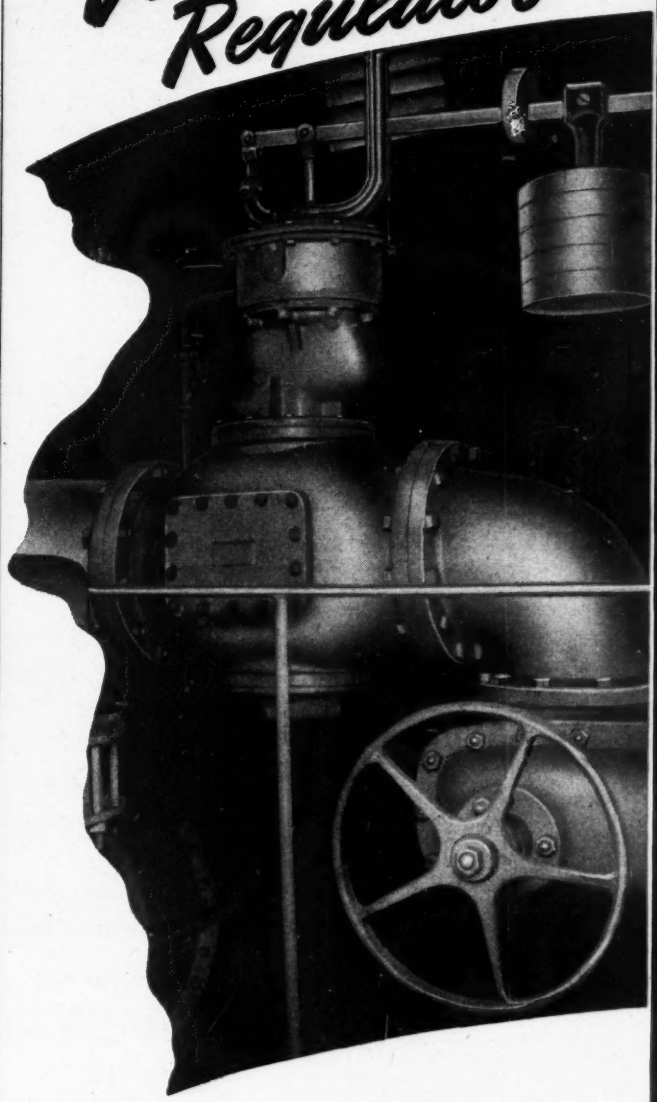
Gentlemen: Please send me.....NGE *Gas Flow Orifice Calculators* for which I am enclosing my check or money order for $..... *Add 2½% sales tax in California.*

NAME .....

COMPANY .....

ADDRESS .....

Reynolds KT Series Versatile Regulator

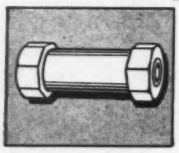


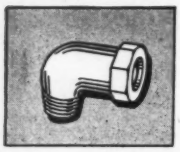
★ Reynolds KT Series Versatile Regulator is manufactured in a range of sizes from 2″ to 12″. It will reduce pressure to inches W. C.—or pounds to pounds. This Regulator can be used where space is limited, making it impossible to use the auxiliary bowl. In addition, Reynolds builds High Pressure Line Regulators with auxiliary bowl, when complete lockup is required. Let Reynolds adapt their new Versatile Regulator to your Gas Control System.

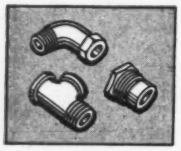
Reynolds GAS REGULATOR CO.
ANDERSON INDIANA U.S.A.

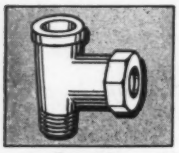
NORMAC COUPLINGS
SLEEVES AND FITTINGS

for maximum deflection, ease of "stabbing," complete confinement of the rubber!



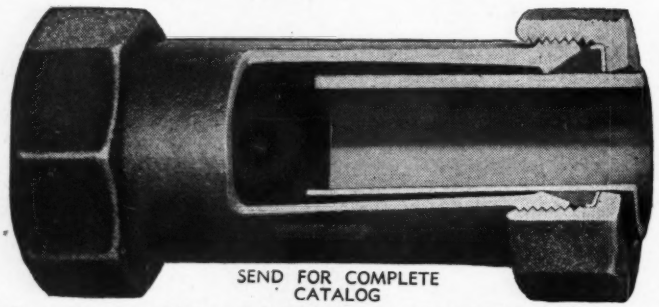






So close are "Normac" rubbers confined at the gasket tip that possibility of flow is reduced almost to "nil." These couplings, sleeves and fittings . . . approved by gas utility men across the country for their time-saving features, ease of handling and dependable service . . . are available in a complete range of sizes. Made from air furnace malleable iron they provide greater wall thickness than pipe on which used.

NORTON-McMURRAY
MANUFACTURING COMPANY
39 South La Salle St. Chicago, Ill.



SEND FOR COMPLETE CATALOG

Couplings - Meter Bars - Sleeves - Cocks - Bell Joint Clamps - Service Tees & Ells

EVERYTHING IS UNDER CONTROL . . . IF YOUR CONTROLS ARE "Standard"

featuring

TM STANDARD
Thermostatic Valve Controls

¾" 172,000 BTU
1" 306,000 BTU

Operated by continuous 24-V current passing through valve magnet and continuously holding valve open. In event of electricity failure, valve immediately closes, shutting off gas in furnace.

ALSO AVAILABLE IN LIMITED QUANTITIES STANDARD TRANSFORMERS AND THERMOSTATS

YOUR PRODUCTS DESERVE THE NEW STANDARD VALVE— THE BEST VALVE MADE

IF IT'S "STANDARD" • IT'S SPECIFICATION QUALITY

Standard REMOTE CONTROL VALVE COMPANY SOUTH PASADENA CALIFORNIA

• **Pittsburgh Equitable Meter Division, Rockwell Manufacturing Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.**—Bulletin 1136 is a catalog of the new line of Rockwell-Emco gas appliance regulators. The three advantages claimed for this design—streamlined appearance, light weight, and improved performance—are explained by detailed drawings and cross-sectioned photographs with explanatory text. A discussion of aluminum alloy pressure castings and their application to regulator construction is covered. Complete technical data on sizes, capacities and dimensions are tabulated.

• **The Foxboro Co., Foxboro, Mass.**—Bulletin 381 describes the Model 40 controller, the company's newest addition to its line of instruments for process control. The operating-panel feature of "Stabilog" control instruments is shown, and the convenience of operation of maintenance, said to be achieved with the Model 40 through unit construction and assembly, is illustrated. Indicating models, as well as single- and multiple-pen recorders are shown, and the five types of control action available in the Model 40 are explained.

• **Acheson Colloids Corp., Port Huron, Mich.**—This company has issued a new technical booklet on colloidal graphite and its use in lubrication, parting, surface coating, impregnation, etc. The 16 pages contain five extended specification tables on dispersions in water, oil, hydrocarbons, alcohol, and special organics; over 25 illustrations of applications; interpretations of the 19 fundamental properties of colloidal graphite; photomicrographs of the material; and reference and indexing to technical bulletins and reports.

McAllen, Texas, Vetoes Well Owners' Compromise

McAllen, Texas, city commissioners have turned down a proposed compromise from owners of gas wells in the local field, which would have reduced the amount of free gas the city can take from one of the wells. Several years ago McAllen was granted a contract under which it could obtain 3 MMcf of gas daily without charge, in return for assistance it gave in blocking up leases on which original drilling took place. Owners of the field offered in their compromise to allow the city 45 MMcf per month for a 15-year period and to furnish the city a gathering line from any of the field's four wells.

Judge Orders $147,000 Paid in Inland Gas Case

Federal Judge H. Church Ford recently directed that Ben Williamson, Jr., Ashland, Ky., be paid $117,000 as trustee of the bankrupt Inland Gas Corp., Ashland, and that his attorney, Clifford E. Smith, Frankfort, Ky., be paid $30,000.

The amount to be received by Williamson is a balance of a yearly allowance of $25,000 from July 1, 1937, to Jan. 1, 1946, less the amount previously received by him from his drawing account. The sum to be received by Smith represents a $7500 a year allowance for 1942-1945.